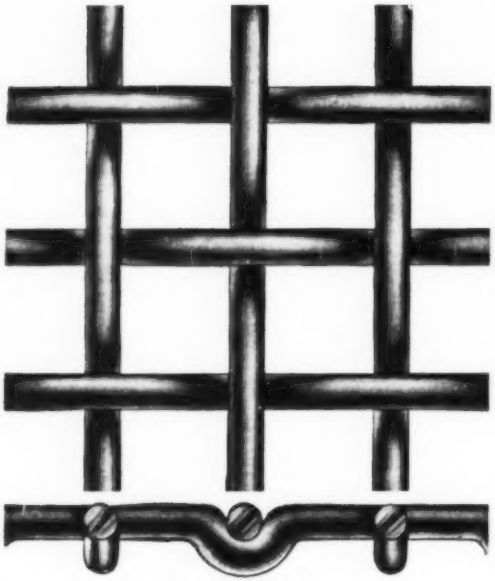
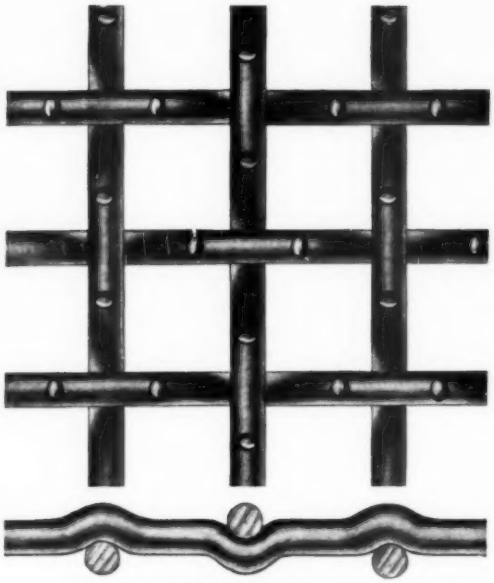
PIT AND QUARRY



STA-SMOOTH



ARCH-CRIMP

SUPER-LOY VIBRATING-SCREEN SECTIONS

SUPER-HARD - - - SUPER-TOUGH - - - SUPER-STRONG

SUPER-LOY SCREENS are made from a high carbon steel specially alloyed to withstand abrasion longer — endure vibration better — resist fatigue to the utmost

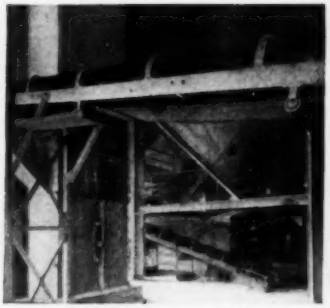
ORDER LUDLOW-SAYLOR HOOK-STRIPS FOR ALL TENSIONED VIBRATING-SCREEN SECTIONS.

THE LUDLOW-SAYLOR WIRE COMPANY

634 S. Newstead Ave. ST. LOUIS 10, MO.

LINK-BELT engineering experience...

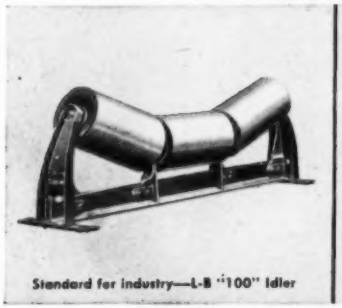
Link-Belt Belt Conveyor system of gravel preparation plant for large western dam.



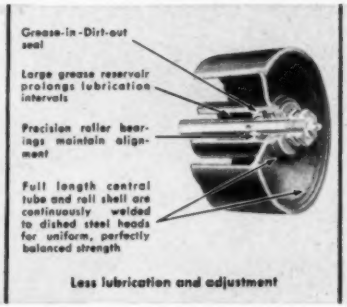
Belt conveyors carrying crushed rock to bucket elevators in a modern cement mill.

Link-Belt Traveling Tripper discharging gypsum rock from belt conveyor in gallery to open yard storage.

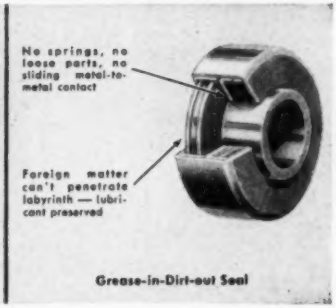
LINK-BELT quality components...



Standard for industry—L-B "100" Idler


Grease-in-Dirt-out seal
Large grease reservoir prolongs lubrication intervals
Precision roller bearings maintain alignment
Full length central tube and roll shell are continuously welded to dished steel heads for uniform, perfectly balanced strength

Less lubrication and adjustment


No springs, no loose parts, no sliding metal-to-metal contact
Foreign matter can't penetrate labyrinth — lubricant preserved

Grease-in-Dirt-out Seal

add up to your best bet in BELT CONVEYORS

LINK-BELT Belt Conveyors provide dependable, efficient travel for many different materials

Get the finest in belt conveyor equipment in your plant. It can be as simple as calling in a Link-Belt engineer while you're still in the planning stage.

Thousands agree Link-Belt builds the finest belt conveyors on the market today. More, it has the most complete line of components—all types and sizes—idlers, take-ups, pulleys, trippers, bearings and power transmission drives. Plus all related equipment—other types of conveyors, feeders, elevators, car dumpers and shakers, shovels, cranes-draglines.

Equally important, Link-Belt Belt Conveyor engineers can draw on the broadest material handling experience in industry. They'll work with you and your consultants—help you come up with the right system for your requirements.

Call or write the Link-Belt branch office nearest you for the services of a belt conveyor expert.

LINK-BELT

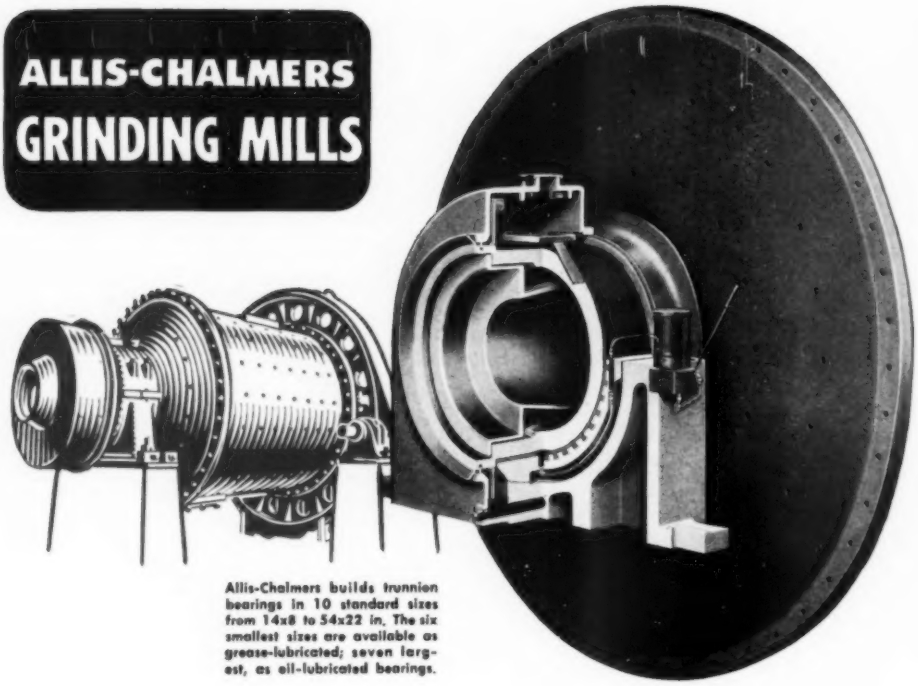
BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in Principal Cities. 13.240-C

PIT AND QUARRY, August, 1951, Vol. 44, No. 2. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

Trunnion Bearing Engineered to End Alignment Troubles

ALLIS-CHALMERS
GRINDING MILLS



Allis-Chalmers builds trunnion bearings in 10 standard sizes from 14x8 to 54x22 in. The six smallest sizes are available as grease-lubricated; seven largest, as oil-lubricated bearings.

BALL AND SOCKET design of this Allis-Chalmers trunnion bearing provides a spherical seat that corrects for *any* minor misalignment of mill and bearing. Load is always distributed evenly across the full face of the bearing.

A complete, self-enclosed oiling system is contained in the bearing housing. Soft babbitt cannot score polished trunnion surface.

Large oil-lubricated trunnion bearings are provided with a hand-operated lubricant pump for floating the mill prior to starting. This eliminates high starting torque, an important feature, since 75 percent of bearing wear occurs during initial starting after shut-down. Motor inrush current is decreased.

Allis-Chalmers builds trunnion bearings in lengths approximately one-half the diameter, in agreement with the latest engineering trend. Ample bearing area keeps bearing pressure low, prolongs bearing life.

The Allis-Chalmers representative in your area can give you more facts about bearings and other features of Allis-Chalmers grinding mills. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3479

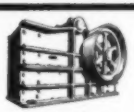
Pulverator is an Allis-Chalmers trademark.

ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Pulverators

Vibrating Screens



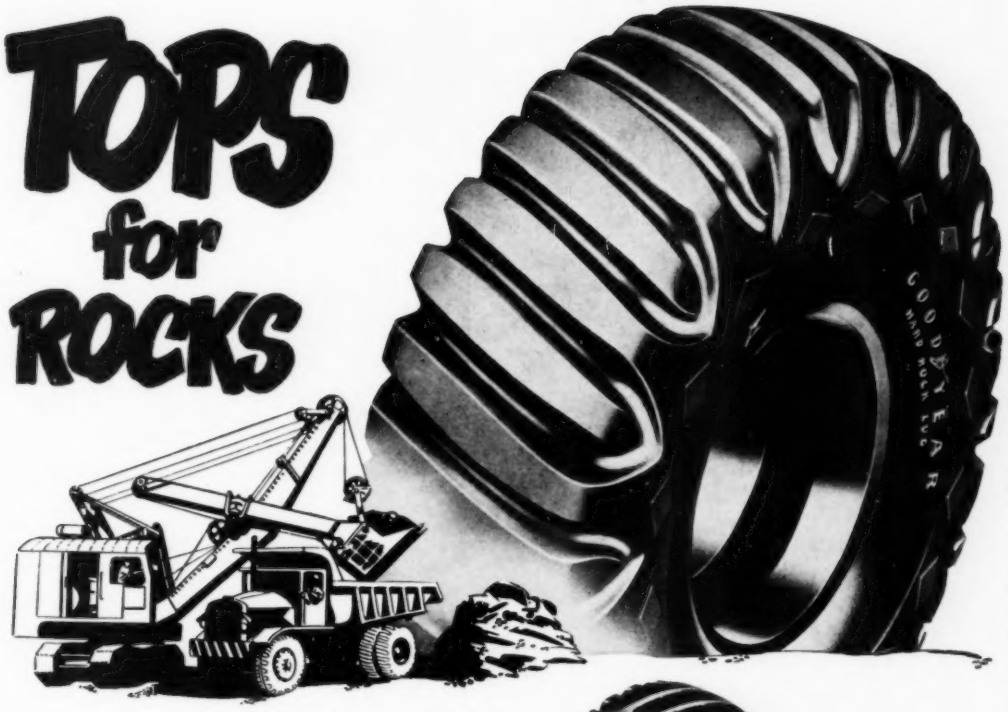
Jaw Crushers

Motors

Gyratory Crushers

Kilns, Coolers, Dryers

TOPS for ROCKS



You need it today more than ever before—this super-tough champ that gives longest tire life, greatest economy on even the toughest rock jobs.

It's Goodyear's Hard Rock Lug, of course—the tire that's specially designed to give you dependable performance now and for a long time to come.

Outstanding features like these make the Hard Rock Lug a favorite of cost-wise mine and quarry operators:

Extra-tough carcass protected against bruising by an extra-thick undertread. Big, tough lug bars armor its tread and sidewalls against cuts and rips. Provides exceptional traction, forward or reverse, with its self-cleaning tread.

Make your tire dollar go miles farther. Remember always to BUY and SPECIFY Goodyear—*it pays!*

HARD ROCK RIB

Companion tire for front wheels in rock work—easier steering, smooth rolling, same cord body, same shoulder and sidewall as Hard Rock Lug

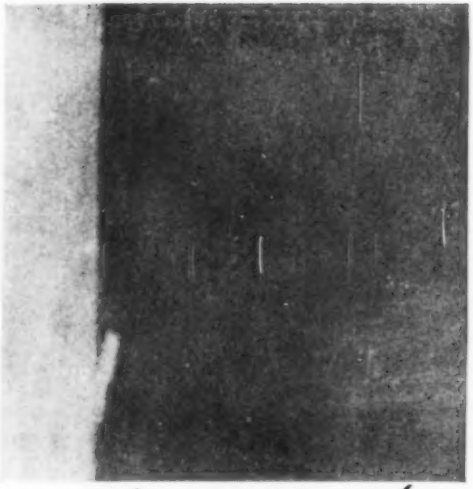
ROAD LUG

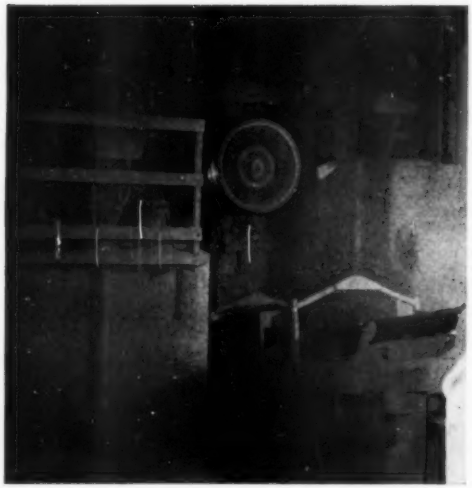
Remarkable dual-purpose tire operates both OFF and ON the road. Combines off-the-road toughness and traction with on-the-road mileage and economy

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio.

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND





The photo that couldn't be taken

...until **DUST** had been **stopped** by a Johnson-March system!

Crushing trap rock is a dusty operation . . . but we never realized how bad it is until we sent a photographer to secure some "before" and "after" shots of Johnson-March dust control systems at work.

Here is his actual report:

"When sprays were shut off, dust accumulation was so heavy that photograph resulted in a blank negative.

"With the Johnson-March liquid diffusion system (installed one year ago) tests show that dust has been cut 80 to 90 per cent."

If you have a dust problem, no matter how large or small, Johnson-March engineers can solve it. Ducts, fans and other cumbersome equipment are not necessary. Johnson-March compounds added to water do the work. Installation is simple and inexpensive . . . in most cases the cost is only 1/10 as much as other types of dust handling systems.

Without cost or obligation, why not have one of our engineers discuss your dust problems with you? Just drop us a line or mail the attached coupon.

THE JOHNSON-MARCH CORP.
1724 Chestnut St., Philadelphia 3, Pa.
Without cost or obligation, I would like to know more about the Johnson-March system of low-cost dust control. Q-1

Name .....
Company .....
Address ..... State .....
City .....

Johnson March

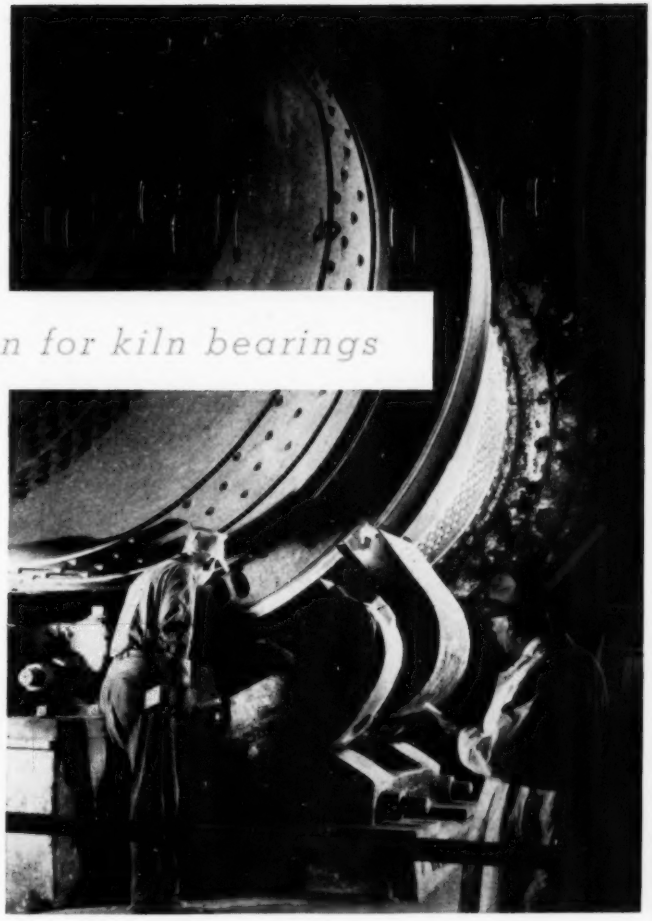
Specialists in Liquid Diffusion

1724 CHESTNUT STREET **Philadelphia 3, Pa.**

Now

Better Lubrication for kiln bearings

Gulf Block Grease



Gulf Block Grease provides a new kind of lubricating performance in cement kiln bearings, and other open top plain bearings in crushers and pulverizers — keeps them operating cooler, and eliminates the need for supplemental oiling.

Gulf Block Grease is manufactured from a high quality lubricating oil and a special soap base under scientifically controlled conditions. The oil provides a protective film as soon as the shaft begins to rotate—and is released at the most economical rates over a wide range of operating conditions. It is effective at temperatures as high as 275° F. yet is not excessively hard at low operating temperatures.

It has excellent oiliness characteristics and does not glaze—which means the bearing always gets the protection of an effective friction-reducing oil film, and doesn't overheat or wipe.

Call in a Gulf Lubrication Engineer and ask him to show you how Gulf Block Grease can help you increase bearing life and reduce maintenance costs. Write, wire, or phone your nearest Gulf office today. Gulf Oil Corporation · Gulf Refining Company, Gulf Building, Pittsburgh 30, Pennsylvania.

FIFTY YEARS OF SERVICE
1901 GULF 1951
PETROLEUM AND ITS PRODUCTS

TELSMITH EQUIPMENT FOR DAMS

TVA's Watauga Dam, Tenn. Four different types of Telsmith Crushers used on this job.

● Huge dam projects and Telsmith Aggregate Plants go together. Many dam builders call in Telsmith engineers right at the start—for consultation as to the proper plant layout and the right equipment to use. Then Telsmith makes the detailed drawings for the erection of the plant and furnishes most of the machinery. Telsmith designed plants have proven their efficiency on many large projects and Telsmith equipment has a world-wide reputation for the production of low-cost aggregate. The ruggedness of Telsmith equipment is strikingly demonstrated by long life in severest service, on successive projects. After producing 1,500,000 tons of aggregate at Center Hill Dam, the same Telsmith equipment is now turning out about the same amount of aggregate at Buggs Island Dam.

Center Hill Dam, Tenn. Telsmith designed complete crushing-screening plant; and furnished most of the equipment.

Buggs Island Dam, Va. This Telsmith crushing plant also produced the aggregate for Center Hill Dam.

Save **TIME and MONEY** **Consult Telsmith Engineers—Ask for Bulletins 266 and 271**

MILWAUKEE TELSMITH WIS. U.S.A.

Norfork Dam, Ark. This 500 ton per hr. capacity combination quarry and sand and gravel plant was Telsmith designed and equipped.

Philpott Dam, Va. Here, too, the crushing-screening equipment is Telsmith.

Mount Morris, Dam, N. Y. The 300-350 tons per hour rock crushing plant is Telsmith designed and equipped.

OTHER DAMS BUILT WITH TELSMITH EQUIPMENT

- Alatoona Dam, Georgia
- Ariel Dam, Ariel, Wash.
- Boysen Dam, Shoshoni, Wyo.
- Carpenter Dam, Arkansas
- Cascade Dam, Washington
- Clark Hill Dam, Augusta, Ga.
- Conowingo Dam, Conowingo, Md.
- Dale Hollow Dam, Tennessee
- Davis Dam, Nevada
- El Presidente Dam, Mexico
- Fort Gibson Dam, Oklahoma
- Grand Coulee Dam, Washington
- Kortes Dam, Wyoming
- Morony Dam, Montana
- South Holsten Dam, Tennessee

MS-11

SMITH ENGINEERING WORKS

504 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

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Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C.

Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

NO-TURN shuttle haul..

Dumptors

SAVE TURN TIME GAIN HAUL TIME

On every haul cycle, Koehring fast-shuttling Dumptors eliminate slow turns — at the loading unit, at the dumping point, on sharp, "zig-zag" grades. They gain *more* productive haul time, because Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse. Here's how much no-turn shuttle operation can increase your production:

By eliminating only 2 turns on a 1,000' haul, time studies prove that Dumptors can save 30 seconds every round trip, and increase hourly yardage output over 10% per unit. What's more — fast, easy spotting and 1-second gravity dump keep production high.

Remember, too — top hauling efficiency also means increased shovel output. For *double profit protection*, team fast-shuttling Dumptors with Koehring heavy-duty excavators. Four sizes: ½-yd., ¾-yd., 1½-yd., and 2½-yd.

KOEHRING
COMPANY
MILWAUKEE 16, WISCONSIN
Subsidiaries JOHNSON • PARSONS • KWIK-MIX

It will pay you to get complete facts from your Koehring distributor. Call him NOW.

IN OPEN PITS OR UNDERGROUND

In confined underground operation, Dumptor spots fast, close to shovel . . . no need to turn. Shovel operator has short swing cycle, a big, easy-to-hit 8' x 8' target, for loading Dumptor over either end or sides.

At dump there's no slow jockeying around. Dumptor drives up, body forward; operator hits body release lever; gravity instantly dumps the 6-yd. payload in 1 second . . . Dumptor heads back without turning.

On no-turn shuttle haul, from underground to surface, loaded Dumptor leaves narrow tunnel in same position as it entered . . . travels same speeds forward and reverse . . . easily climbs 24% grades fully loaded.

Increase *central-mix* output with

Johnson *Octo-Bins* hold 150 to 3000 yds

With overhead storage capacities ranging from 150 to 3000 yds., Johnson Octo-Bin Plants offer many big-production advantages for central-mix or transit-mix operation. Up to 8 aggregate compartments can be arranged radially around large central cement compartment. Cement tank capacities range from 150 to 1350 bbls., and can be divided into 4 compartments.

Johnson engineers specialize in tailoring these plants to suit exact production requirements. For example . . . Central-Mix Octo-Bin shown above has 6-compartment, 400-yd. aggregate storage bin, charged by inclined conveyor . . . and 400 bbl. cement tank, fed by bucket elevator from 1032 bbl. ground storage silo. 3-yd. Concentric Batcher and Johnson Water Weigh Batcher, discharging into Koehring 2-yd non-tilting mixer, maintain accuracy at top production speed.

(Get the most from Johnson Plants . . . use Koehring mixers)

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Send for 26-page engineering catalog on Johnson Plants.

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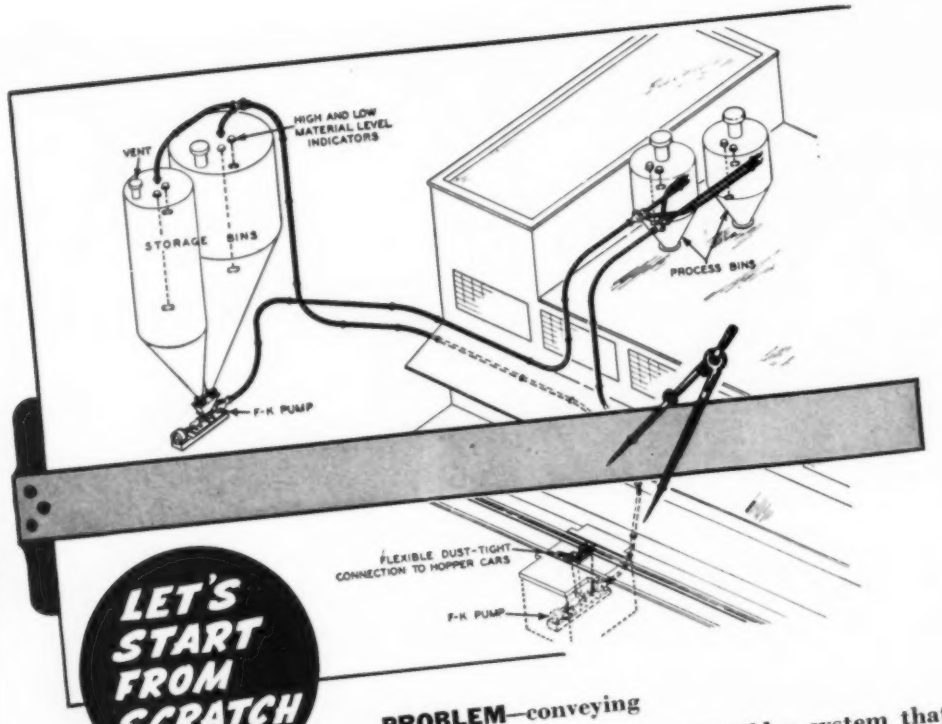


LET'S START FROM SCRATCH

PROBLEM—conveying

SOLUTION—to design and build a system that will meet your requirements, better your operation

Fuller Company occupies an unique position in the field of pneumatic conveying of dry pulverized and granular materials. It designs and manufactures four primary types, from which it can select that best adapted to specific requirements; in other words, equipment best suited to do the work most efficiently and economically, with the materials to be handled.

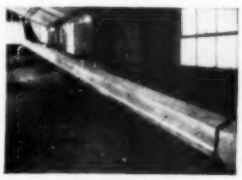
Each job should be considered separately. That's why we say, "Let's start from scratch" . . . when the plant is in the design stage. A preliminary study should be made of local conditions, so that proper equipment can be recommended. The selection of the type of equipment, and its layout, best adapted to satisfy any individual set of conditions, should be made by specialists of wide experience in the engineering of pneumatic conveyors. We strongly urge all prospective purchasers to avoid the preliminary engineering, but to permit us to submit a recommendation, or engineering study, comprising a proposal drawing and estimate for your approval, or the approval of your consulting engineers.

Fuller Company has a tangible resource in the years of experience and training of its personnel in all phases of pneumatic conveying. Its engineers are at your service, ready to make studies of your requirements, and suggest means for the betterment of your operation. You're under no obligation for this service.

FULLER-KINYON

AIRVEYOR

FULLER-FLUXO



F-H AIRSLIDE

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS, AND ASSOCIATED EQUIPMENT

G-87

Fuller

FULLER COMPANY, Catasauqua, Pa.
120 So. LaSalle St., Chicago 3
420 Chancery Bldg., San Francisco 4

husky equipment...

The Model 4500 crane, built by Manitowoc Engineering Works, lifts a 4-5 yard drag bucket on a 140 foot boom, or 100-ton working loads at 20 foot radius.

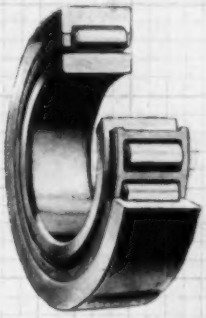
This heavy work requires rugged, dependable component parts. That's why Torrington Spherical Roller Bearings are used on the main drive shaft and dragline countershaft assemblies, and Torrington Radial Roller Bearings on the front drum shaft.

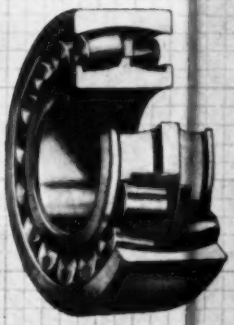
Self-Aligning Spherical Roller Bearings prevent binding stresses by compensating for shaft deflections caused by shock loads. All Torrington Bearings are precision-made from specially selected steels, carefully heat-treated to assure high load capacity and long, reliable service.

Torrington engineers have had many years of experience in helping to apply all major types of anti-friction bearings and will be glad to work on your problem.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON BEARINGS





TORRINGTON BEARINGS

SPHERICAL ROLLER
TAPERED ROLLER
STRAIGHT ROLLER
NEEDLE
BALL
NEEDLE ROLLERS

We know mine power and shovel cable

—we're miners ourselves!

Power shovel loading blasted copper ore in the Chuquicamata, Chile, open pit mine of the Chile Exploration Company, an Anaconda subsidiary.

We know what ANACONDA Mine Power Cable and SH-D Securityflex Shovel Cable can do for your production because we're miners ourselves. We watch their performance in our own mines.

Here are the important features of ANACONDA Mine Power and Shovel Cables that produce more mine output per dollar of cable investment and maintenance:

Butyl Insulation for higher dielectric strength and resistance to moisture; for less damage by heat and compression.

Neoprene Jacket and Fillers for light weight, flexibility, flame resistance, freedom from electrolysis. Neoprene makes a tougher jacket, costs you less, makes cable more adaptable, easier to handle.

Special Features of Type SH-D Securityflex Shovel Cable are its patented non-kinking rubber-cored ground wires that provide large contact area with the conductor shield; the copper-cotton conductor shield that eliminates chafing failures, greatly simplifies splicing.

Ask your nearest Anaconda Sales Office or Anaconda Distributor for complete information. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

51858

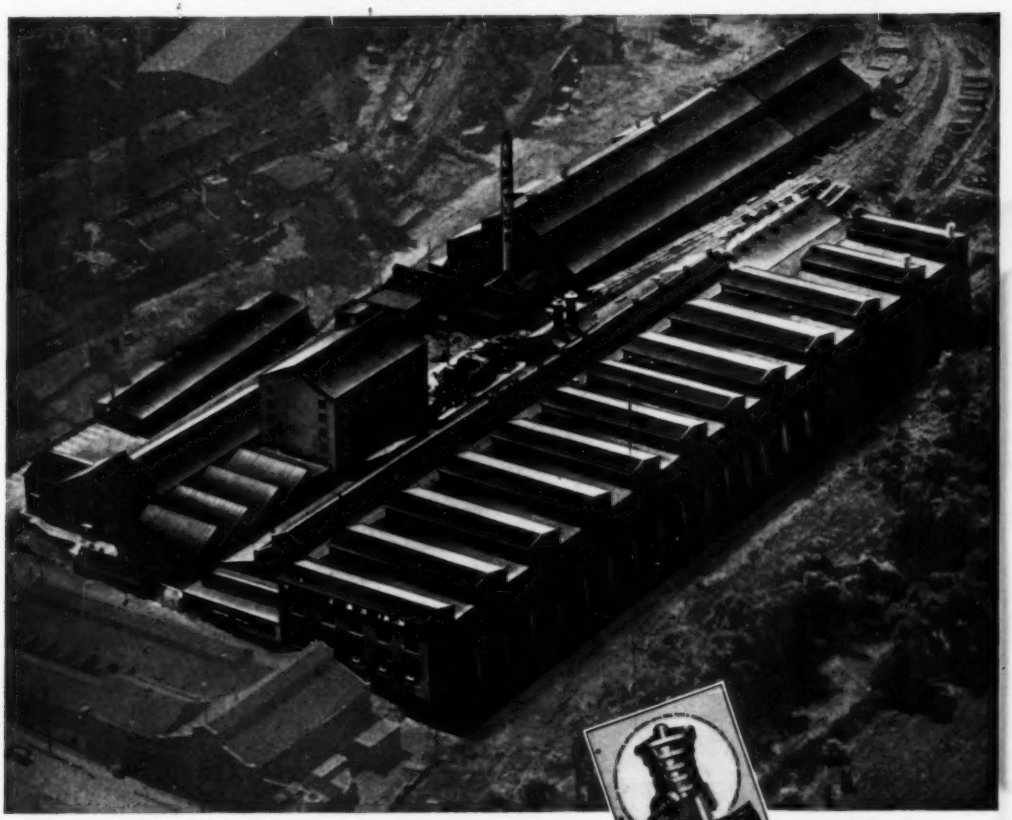
the right cable for the job

ANACONDA®

WIRE AND CABLE

One Source

FOR ALL YOUR STONE CRUSHING MACHINERY



If you have a big job to get underway, you can save a good deal of time and energy by buying all your Stone Crushing equipment from Traylor. Our large, modern plant . . . fully equipped to build the heaviest machinery with ease and dispatch . . . is so well arranged that each order receives personalized attention and follow through. We would welcome an opportunity to discuss your requirements without obligation. In the meantime, send coupon for free catalog on the complete line of Traylor equipment.

Traylor

Rotary Kilns, Coolers and Dryers · Grinding Mills
Jaw, Reduction and Gyratory Crushers · Crushing Rolls

TRAYLOR ENGINEERING & MANUFACTURING CO.
378 MILL ST., ALLENTOWN, PA.

Please send literature as checked

☐ Bulletin 6120 on Traylor Stone Crushing Machinery
☐ Booklet describing Traylor's complete metal-working facilities.

*Name*_____

*Company*_____

*Address*_____

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SALES OFFICES: New York, N. Y.; Chicago, Ill., Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd, Montreal, P.Q.

A "TRAYLOR" LEADS TO GREATER PROFITS

WIRE ROPE

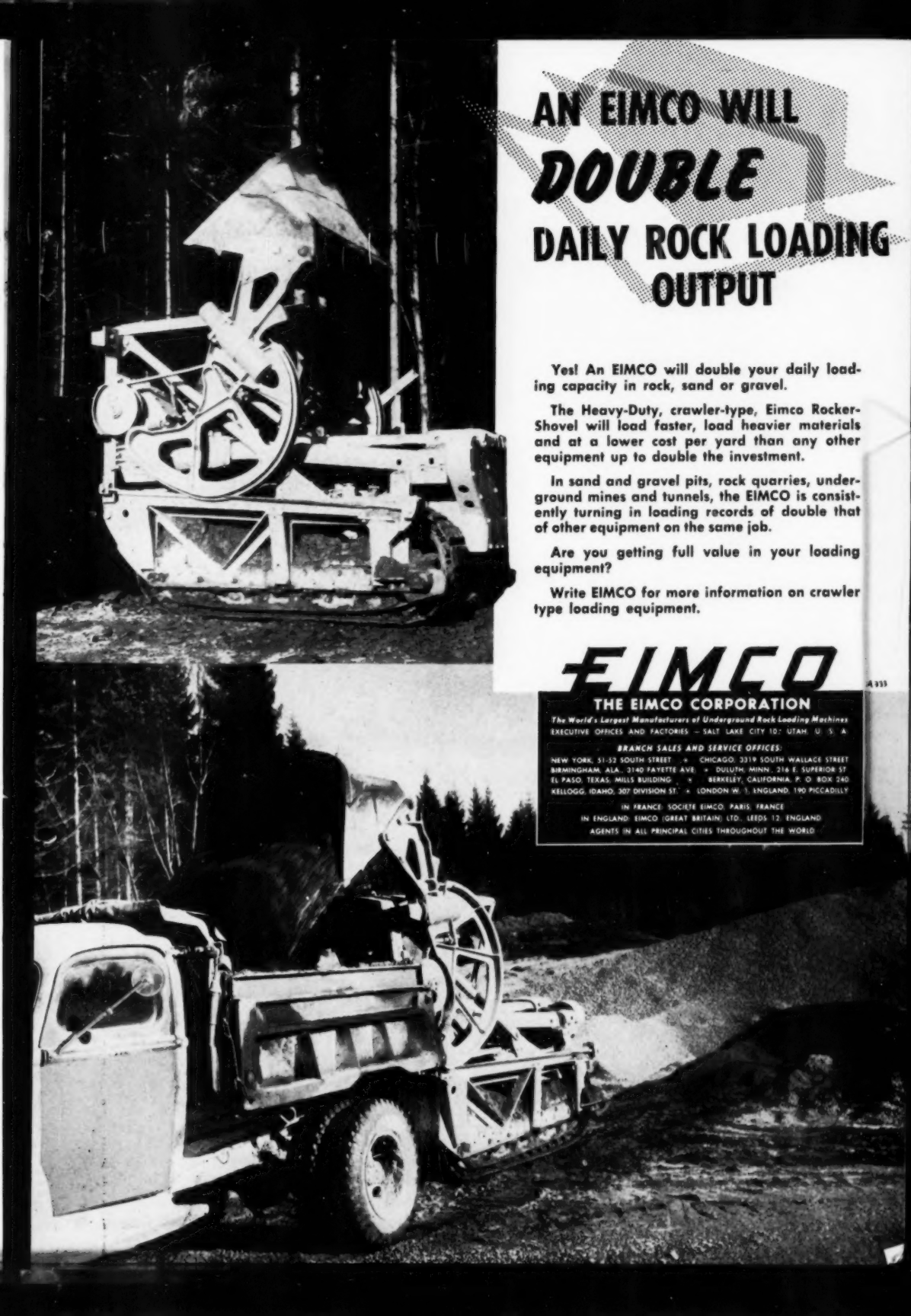
For better performance on quarry excavating equipment it's ROEBLING rope

FOR EASY HANDLING, extra toughness and service life, there's nothing like Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel—made only by Roebling—gives rope top resistance to abrasion and fatigue. And Roebling Preforming gives you a rope that spools better... doesn't tend to set or kink... minimizes vibration and whipping.

There is a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field man help choose the rope that will give you the best and the lowest-cost performance. Still further savings may be effected by following his suggestions about the proper installation, use and maintenance of wire rope. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***



AN EIMCO WILL *DOUBLE* DAILY ROCK LOADING OUTPUT

Yes! An EIMCO will double your daily loading capacity in rock, sand or gravel.

The Heavy-Duty, crawler-type, Eimco Rocker-Shovel will load faster, load heavier materials and at a lower cost per yard than any other equipment up to double the investment.

In sand and gravel pits, rock quarries, underground mines and tunnels, the EIMCO is consistently turning in loading records of double that of other equipment on the same job.

Are you getting full value in your loading equipment?

Write EIMCO for more information on crawler type loading equipment.

EIMCO

A 935

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.

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EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIFORNIA, P. O. BOX 240
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AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

SAVE *RE*-HANDLING and produce a BETTER PRODUCT

with RAYMOND WHIZZER EQUIPPED IMP MILL

This is one of the versatile pulverizing units in the Raymond line for medium capacity operations in the production of softer non-metallics, such as ball and sagger clays, ceramic clays, fire clays and similar materials.

The whizzer principle assures consistent finished products, and provides instant fineness control over a wide range. Different grades of product can be readily produced in the same unit.

The Imp Mill may be equipped with Flash Drying accessories for removing high percentages of initial moisture while pulverizing. This combination process of drying, grinding and separating in a single unit shows large economies in handling wet clays and other moisture laden materials.

In some applications, a throw-out attachment may be used with the whizzer separator for automatically rejecting hard oversize impurities in the classifying operation. For further details of the Whizzer Type Mill . . . Ask for Catalog No. 67.

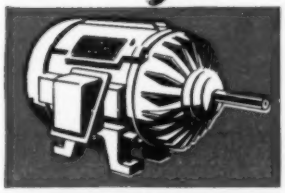
COMBUSTION ENGINEERING – SUPERHEATER, INC.

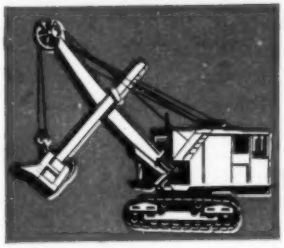
Raymond
PULVERIZER DIVISION

Sales Offices in Principal Cities

1321 North Branch St. Chicago 22, Illinois

Quarry Equipment Staying Power Upped BY THESE 4 STEPS





1st step: Examine Cities Service lubricants for out-and-out quality through your purchasing experts or test facilities . . . or from service records established by critical users.

2nd step: Look into the completeness of the Cities Service line as an aid to simplified ordering and prompt, steady supply . . . backed by the extensive facilities and intensive cooperation to keep you out of any lubrication "jam."

3rd step: Review today's most effective lubrication practices by consulting that fully informed specialist, the Cities Service Lubrication Engineer.

4th step: Ask about this high character line and the practical technical assistance now upping quarry equipment staying power for many of the industry's "hardest drivers." Phone or write CITIES SERVICE OIL COMPANY, Room 73, Sixty Wall Tower, New York City 5.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

NOPCO ERTRANE C

MEETS ALL REQUIREMENTS OF

ASTM SPECIFICATION C226-50T

—which means that it is a fully accredited air-entraining agent for use in the manufacture of air-entraining cement made in conformance with:

ASTM SPECIFICATION C175-50T

(the specification that reflects the current policy of Committee C-1, as adopted on September 26, 1950)

Ertrane C has been subjected to rigid tests in the qualified laboratories of E. L. Conwell & Co., Philadelphia, and has met all eight requirements of C226-50T in regard to its effect on the properties of portland cement — actually *surpassing the required standards by impressive margins in virtually every instance.*

Here are some of the important results obtained (using test specimens made and cured as specified in ASTM C192-44T):

Compressive Strength of Concrete, p.s.i. — 6" x 12" cylinders				
Cement Content	Type Cement	After 1 Year (av. for 3 tests)	% Strength of Concrete made with cement using Ertrane C	
4.0 Bag Mix	I	3650		
	IA	3570	98%	
	II	3290		Requirement: 85% min.
	IIA	3030	92%	
	III	3785		
	IIIA	3375	89%	
6.0 Bag Mix	I	5085		
	IA	5005	99%	
	II	4640		Requirement: 85% min.
	IIA	4330	94%	
	III	5185		
	IIIA	4700	91%	

NOPCO TRADEMARK EVOLVED THRU RESEARCH

NOPCO CHEMICAL COMPANY

Branches: Boston • Chicago

Flexural Strength of Concrete, p.s.i.—3" x 4" x 16" beams				
Cement Content	Type Cement	After 6 mos. (av. for 4 tests)	% Strength of Concrete made with cement using Ertrane C	
4.0 Bag Mix	I	625		
	IA	638	102%	
	II	725		Requirement: 85% min.
	IIA	650	90%	
	III	810		
	IIIA	735	91%	
6.0 Bag Mix	I	775		
	IA	788	102%	
	II	888		Requirement: 85% min.
	IIA	863	97%	
	III	1025		
	IIIA	900	88%	

Resistance to Freezing and Thawing

Test specimens: 3" x 4" x 16" beams—5.5 bags of cement per cu. yd.

Specimens cured 28 days moist, and 48 hours immersed in water at 73.5°F. Completely immersed in water during freezing and thawing cycles.

10 cycles per day automatically controlled 0°F. to 40°F.—center of specimen temperature recorded.

Per Cent Change in Dynamic Modulus Cycles (average 3 beams)								
Cement	25	50	75	100	125	150	200	Flexural Strength (one beam)
I	4	7	13	18	24	28	49	388
IA	1	2	2	4	5	6	8	563
II	2	6	16	26	32	36	44	430
IIA	2	2	5	9	10	10	11	630
III	6	15	18	21	29	40	81	400
IIIA	5	5	6	7	7	9	10	672

● **All the foregoing results prove conclusively that air-entraining portland cement employing Nopco Ertrane C assures concrete of *good strength* and *excellent durability*.**

LOOK AT THESE ADVANTAGES

In addition to imparting *excellent durability* to concrete, Ertrane C affords outstanding advantages to both the cement manufacturer and the cement user. For example:

EASY, ECONOMICAL HANDLING. It is only necessary to add Ertrane C to water and stir until dissolved. No control testing required. Result: Considerable savings in time and labor at the mill.

IMPROVED PLASTICITY. Ertrane C provides durability and plasticity (through air formation), and also imparts highly desirable qualities that *increase workability and placeability.*

IMPROVED WATER REPELLENCY AND STORAGE LIFE. In view of its composition, Ertrane C gives *more water repellency* than straight resin soaps. This characteristic helps to prevent cement from caking in storage.

GOOD COST/PERFORMANCE RATIO. On a cost/performance basis, Ertrane C is more *economical* than any air-entraining agent on the market.

Ertrane C is immediately available, in any quantity, from Nopco's plants at Harrison, N. J., Chicago, and Cedartown, Ga.

Fill out the attached coupon. We shall gladly send you full information, and make recommendations based upon your particular requirements.

Harrison, New Jersey

Cedartown, Ga. • Richmond, Calif.

NOPCO CHEMICAL COMPANY
Harrison, New Jersey

Gentlemen:

I am interested in learning more about Ertrane C. Will you kindly—

☐ send me further details—including full report of tests made by the E. L. Conwell Co. laboratories.

☐ have your representative call.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Barber-Greene

B-G

Redi-Fab BELT CONVEYORS

EASY SELECTION FROM CATALOGED UNITS

Experience has shown that most of your belt conveyor requirements are met by units that form a specific segment of the vast Barber-Greene Conveyor line. That segment is the Redi-Fab series—the conveyor sizes you most frequently need. These conveyors have been engineered and conveniently cataloged in a wide variety of small increments of width, length and horsepower. Redi-Fab series components—truss sections, drives, takeups, power units, terminals and complete accessories—are "packaged" for off-the-shelf delivery.

FAST QUOTATION, DELIVERY, ERECTION

Actually, you can select your Redi-Fab Conveyors, and order the proper components, directly from Catalog RF —an entirely new approach to conveyor selection. Better still, work with your B-G distributor representative. Without costly time-consuming engineering, you can choose the conveyor that exactly meets your needs. Quotation and delivery are faster because you select from standard, pre-built units normally available from distributor or factory stock. Erection is simpler—all units are delivered clearly marked for fast, easy assembly.

NOW More than ever, machines must be used most effectively. Redi-Fab Conveyors offer the fast, sure way to release shovels, cranes, tractors and the like for more productive work — to minimize man power requirements and increase productivity. Send for your copy of Redi-Fab Catalog RF.

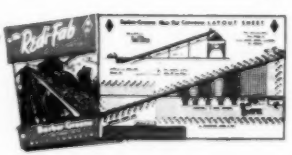
BARBER-GREENE COMPANY

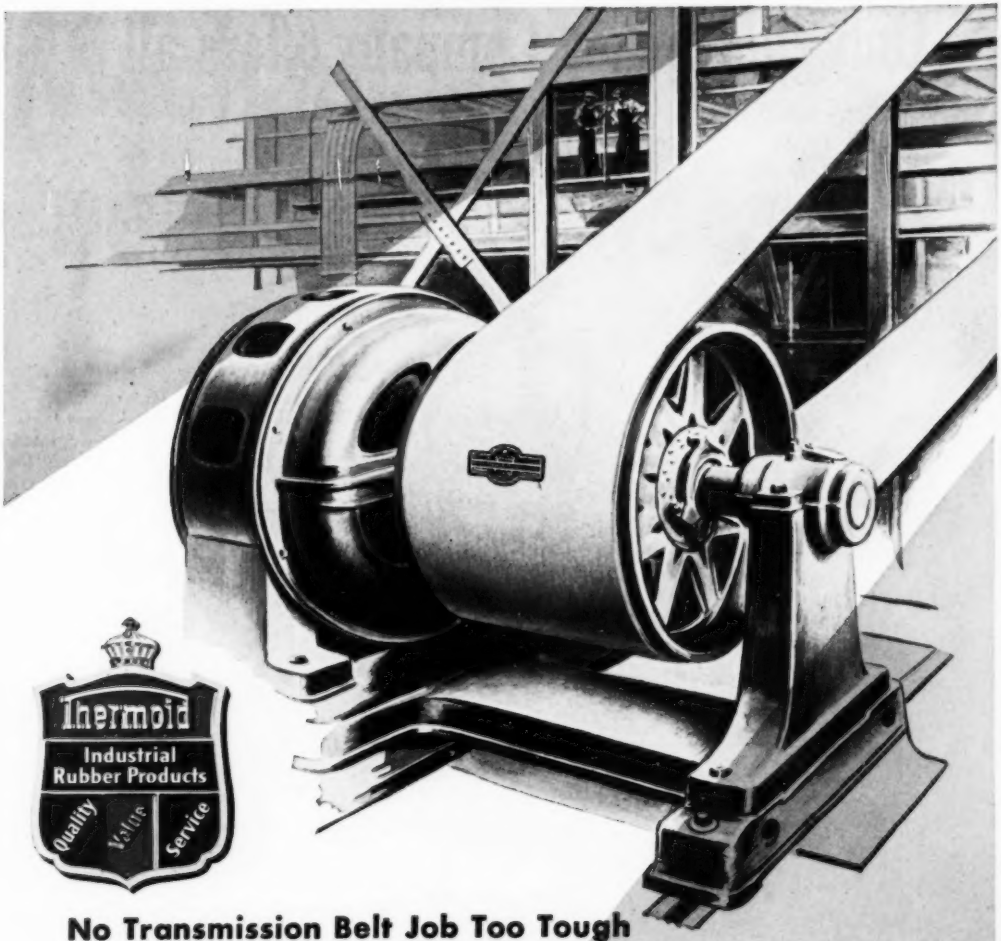
AURORA, ILLINOIS, U. S. A.

send for Redi-Fab catalog

The new 40-page catalog makes it simple for you to figure your own conveyor requirements if you wish. No knowledge of horsepower required. The catalog makes possible the proper selection of the conveyor with the correct size of drive and motor. In fact, with the new layout sheet in the Redi-Fab Catalog, you can make your own layout — accurately, down through all details including the A-frame supports. Write for your copy, or ask your B-G distributor.

202A





Thermoid
Industrial
Rubber Products
Quality Value Service

No Transmission Belt Job Too Tough ...For Thermoid

Have you some really tough transmission jobs—regular belt killers? They won't be too tough for a Thermoid Transmission Belt. Let your Thermoid Distributor prove that by furnishing exactly the right belt for your job.

For general service he will offer "400", the all-purpose belt that will satisfactorily service all normal operating requirements.

For severe service, or for high speeds with small pulleys, he will recommend Thermoid High Speed "R", made with extra strong, hard 35-oz. duck and top grade rubber. Where there are oil or fumes injurious to rubber, he will recommend Thermoid High Speed "N", with Neoprene friction and skim. Each type is practically custom-built for the service for which it is recommended.

Here's The Book That Will Answer Many of Your Questions

Ask for your free copy of Technical Bulletin No. 3678. It contains practical information, charts, tables and diagrams which will help you select the right transmission belt for your requirements.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

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Only the Timken Company offers all 3 rock bit types

and a complete Rock Bit Engineering Service!

WHAT do you want most from your rock bits—lowest bit cost per foot of hole, greatest possible drilling speed, or other advantages? Whatever it is, you can get it from the Timken Company, the only manufacturer who can offer you all three types of rock bits:

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TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit ... for every job

Mechanical soldiers need good shoes, too!

THESE are days of grave concerns . . . of conservation and mobilization for strengthening the nation's defense—for the survival of our national economy—for the continuance of useful highway, airfield, dam-site and other aggregate-consuming construction programs—for the keeping of every home-front machine in condition to stay on the job until its replacement again becomes a normal procedure.

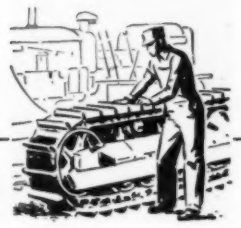
That includes *your* equipment and emphasizes *your* responsibilities. To benefit fully from the productive life that has been built into your "Caterpillar" equipment, you must be alert to its needs as time and hard usage take their toll in wear and depreciation. For instance:

How are your "Caterpillar" track shoes?

Tough as they are, they can't battle rocks, shale, jolts and grinds forever. Growing shortages in the premium steels that go into them may make early replacements difficult—and extra care of track parts something to think about.

CATERPILLAR, PEORIA, ILLINOIS

DO THIS NOW



YOU'RE THE DOCTOR. Check those sprockets, grousers, rollers, idlers, pins, links and bushings. Proper track adjustment minimizes wear. Sprockets may need switching from side to side, and pins and bushings need turning, to provide new wearing surfaces. Shoes serve longer if you have worn grousers built up before excessive wear occurs.

Reread your Operator's Instruction Book. Anticipate your future parts requirements. Take the facts to your "Caterpillar" dealer. His modern facilities and skilled servicemen are at your disposal. He can rebuild many parts to keep your machines on the job. Their added life will repay the reconditioning cost over and over.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

WHEREVER ENGINES WORK

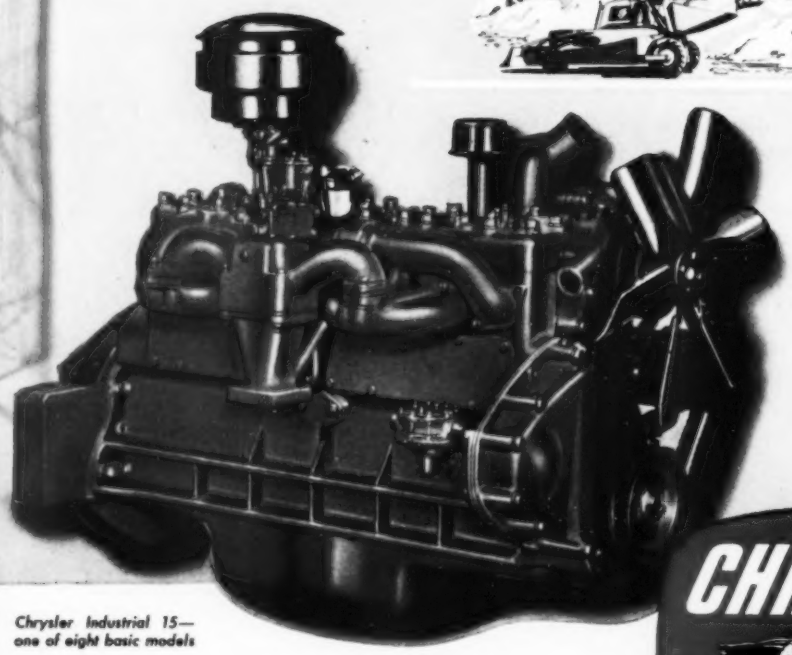
In Construction, Chrysler Powers
Ditching Machines • Cranes • Truck Mixers • Shovels • Loaders • Yarders • Concrete Mixers • Road Pavers • Crane Carriers • Scoop Tractors

In Industry, Chrysler Powers
Air Compressors • Hoists • Derricks • Pumps • Generators • Tractors • Arc Welders • Baling Machines • Conveyors • Tackle Blocks • Winches

Chrysler Industrial Engines Do a Better Job at Lower Cost!

In Farming, Chrysler Powers
Tractors • Combines • Gang Mowers • Spreaders • Irrigation Equipment • Orchard Sprayers • Hay Choppers • Pumps • Feed Mills • Sprinklers

In Other Fields, Chrysler Powers
Locomotives • Motor Coaches • Air Conditioning Equipment • Pulp Machines • Drilling Equipment • Fire Pumps • Snow Plows • Street Flushers • Saw Mill Equipment • Oil Well Pumps and Drillers



Chrysler Industrial 15—one of eight basic models

More manufacturers, more operators of industrial equipment are discovering the brilliant efficiency of Chrysler Industrial Engines on scores of different applications.

For Chrysler Industrial Engines are built *solely for industrial jobs.* Furthermore, Chrysler Industrial Engines are designed and engineered to meet the *specific working requirements* of each type of equipment they power. They can also be adapted to special regional operating conditions.

A letter of inquiry will bring an engineer well qualified to discuss your particular application. Address: *Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.*

CHRYSLER

HORSEPOWER WITH A PEDIGREE

Take QUARRY JOBS IN STRIDE

Extra braced and specially faced Bucyrus-Erie Bulldozers and Bullgraders have proved themselves on everything from shale to granite. Here are a few reasons why they can take the daily quarry pounding and come back for more.

1. Cutting edge is of special wear-resistant alloy steel, bolted to the blade with extra tough alloy plow-bolts.
2. Backs are reinforced top-and-bottom by flanged beams providing extreme rigidity and resistance to distortion.
3. Box section main frame is a welded unit with castings at the corners to withstand extra stresses concentrated at these points.
4. Replaceable cast alloy steel corner shoes are heat-treated and hard-surfaced to provide a flint-like facing.
5. Bulldozer blade assembly is solid welded without pin connection, giving the front-end single unit stability.

For rough and tough quarry dozing, you can't beat these outfits. Your International Industrial Tractor Distributor will be happy to give you many additional reasons why.

200T51

BUCYRUS ERIE

SOUTH MILWAUKEE
WISCONSIN

For championship dirt-moving performance, investigate the

BIG RED TEAM

International TD-24 Tractor with Bucyrus-Erie B-170A or B-250 Scraper.

See Your INTERNATIONAL Industrial Tractor Distributor

High-Speed DOZER on RUBBER

MORE THAN DOUBLES CRAWLER OUTPUT

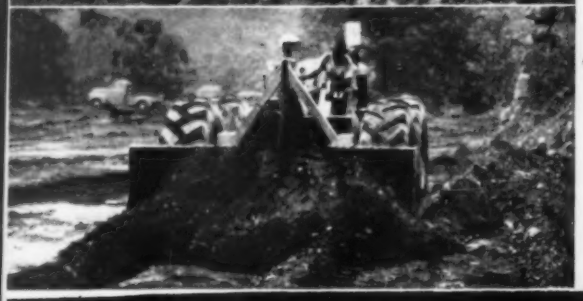
Feeding gravel from pit to plant on highway surfacing near Orem, Utah, Strong Co. of Springville moved 142.1 station yards an hour with a 144 h.p. crawler-dozer . . . 303.34 station yards hourly with a rubber-tired Tournadozer. On typical 321' one-way push, Tournadozer averaged 94.5 pay yards hourly . . . 13.3 more yards than crawler record for 175' one-way. Haul was 80% longer, yet Tournadozer increased production 16%.

STRIPS SHALE

At their Middle Branch, Ohio plant, Diamond Portland Cement Company strips shale the year around. During winter, their veteran C Tournadozer penetrated and broke up 15" to 18" of frozen shale, cleared the large slabs out of way, then dozed loose shale to shovel. "Our Tournadozer will move as much shale in 1/2 day as our crawler can in a full day," reports Vice President and Plant Manager E. R. Evans. "It also has saved us a lot of money in moving costs." Down pressure on blade available.

HANDLES SHOVEL CLEAN-UP

Lone Star Steel Co., Dallas, Texas, replaced three 144 h.p. crawler tractors with one 186 h.p. Tournadozer at their Daingerfield iron mine. They report the "C" easily serves 3 to 5 shovels and draglines . . . making a 1.3-mile swing around 5 units in 45 minutes . . . while each crawler formerly handled one or, at the most, two excavators. Says Division Supt. W. L. Kendrick, "On this work, where speed, mobility and power are essential, Tournadozer has proved very satisfactory."



CLEARS, GRADES PIT FLOOR

To open an extended coal seam at a Harlan, Kentucky mine, this high-speed, rubber-tired C Tournadozer stripped a 45' cliff face. Material was 90% rock . . . blasted, then pushed 5' to 200' off a steep ledge. On straight dozing, cleaning the coal seam, "Tournadozer does about twice the work of a crawler," reports the mine superintendent. In its spare time, the versatile, hard-working Tournadozer also has built mine access roads up the side of the mountain.

LETOURNEAU PEORIA, ILLINOIS — JOB-PROVED The World Over — **TOURNADOZERS**

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

gets more work done

See for yourself how much more profit you can make on pushing, pulling, or dozing assignments with a new job-proved C Tournadozer. This powerful dozer *"runs"* on giant 21.00 x 25 low-pressure tires at speeds up to 19 m.p.h. . . . works in mud, sand, or snow which would stall ordinary crawlers . . . drives on-the-job or from job-to-job over paved highways or cross-country. Tournadozer eliminates the need for trailers or time-consuming blocking. It goes anywhere, any time . . . keeps working and earning even during normal shutdown seasons. With either its standard bulldozer blade, or any of 9 auxiliary tools, Tournadozer's high-speed, 4-wheel drive on rubber, and fast, easy electric controls will pay off by getting more work done. For proof, check the actual job performances shown here . . . then see your LeTourneau Distributor for complete facts . . . or write for LeTourneau Bulletin *TODAY!*

STOCKPILES BULK MATERIALS

At Port of Iquique, Chile, Compania Salitrera de Tarapaca y Antofagasta speeds the flow of bulk nitrate from mine to ship with this C Tournadozer. Working in 2 concrete-floored warehouses (combined capacity, 88,200 tons) the "C" helps stockpile nitrate as it is brought in by a shuttle conveyor system . . . later, pushes nitrate through hatchways for conveyor delivery to cargo ships at the docks. Rig's giant rubber tires protect the concrete floors.

PULLS EQUIPMENT

Towing 13-yd., bottom-dump wagon from gyp conveyor to dump is one of many maintenance tasks Tournadozer handles 24 hours a day, 7 days a week around a bauxite ore mine near Little Rock, Arkansas. The "C's" 186 h.p. diesel engine and 4-wheel drive on giant 21.00 x 25 low-pressure tires provide plenty of drawbar pull to add extra profits as a prime mover for Rooters, Carryall Scrapers, Sheepsfoot Rollers, plows, flatbeds, etc.

SPOTS CARS

Tournadozer is handy for moving cars in yard or on siding. Can push or snake with cable. Here, it spots railcars under loader for a Mesabi Range mining company near Keewatin, Minnesota. The "C" can cross tracks or follow rail lines anywhere, without planking . . . drives at 19 m.p.h. speeds over paved highways or cross-country. Its big, 21.00 x 25 low-pressure rubber tires prevent damage to rails, leave no chamfered or gouged ties, don't cut paved surface.

To: R. G. LeTOURNEAU, Inc., Peoria, Ill.—We may be in market for one or more C Tournadozers. Please send information on this powerful 4-wheel-drive prime mover for use with:

Name..... Title.....
Company.....
Street..... City, State.....
Type of work.....

- ☐ Bulldozer
- ☐ Angledozer
- ☐ Carryall Scrapers
- ☐ Logging Winch
- ☐ Tree Pusher
- ☐ Snow Plow
- ☐ Side Crane
- ☐ Rooters
- ☐ Rollers
- ☐ Root Rake

LeTOURNEAU LET

There IS something YOU can do ABOUT INFLATION!

Your future... the future of your business, large or small, depends on how many people understand the story in this booklet!
HOW STALIN HOPES WE WILL DESTROY AMERICA

Businessmen recognize ***inflation*** *as the nation's greatest single threat. But most of us have felt "What can one man—even one business—do to stop it?"*
But there is a way—if enough of us work at it. We can help more people . . . the men and women who work and vote and pay taxes . . . to understand the nature of inflation, its ***causes*** *and* ***cures.*** *Then we will have gone a long way toward eliminating this pending catastrophe.*

ONE TOOL YOU CAN USE: To help us give our own Bemis workers the inflation picture, we used the colorful, new 16-page booklet "How Stalin Hopes We Will Destroy America" produced by Pictorial Media, Inc. The more widely the booklet is used, the more good it will do . . . and it is available for distribution to your workers, too. It follows the time-proven "comic book" technique . . . dramatizes the dangers . . . and shows how all our citizens can help halt inflation before it's too late.

TESTS SHOW IT HELPS WORKERS: To get an impartial judgment of the value of "How Stalin Hopes We Will Destroy America," it was tested in Bemis plants by the Psychological Corporation under the direction of Dr. Henry C. Link, a foremost research authority. Dr. Link says "Those workers exposed to the booklet were found to have a significantly higher appreciation of the recommended ways to stop inflation than did the workers who did not see the booklet. Details of this test are available upon request." And Bemis factory workers make such statements as "Everything it says hit home, but you'd never figure it out for yourself until you read it". . . ."It's told in an interesting way so anyone can understand. My daughter, age ten, understood all of it"..."In picture form it impresses you more. Most people don't read about it"..."Had ideas that we wouldn't think about otherwise while we are working away—good book, agree with it—I guess I won't be the only one."

Because we believe this message is growing more urgent every day, Bemis is taking this means to commend to other businesses this weapon against inflation. It is the first of a series of such material that we expect to use.

BEMIS BRO. BAG CO.
St. Louis 2, Missouri

FOR EVERY BUSINESS, LARGE OR SMALL: In quantities, it costs only a few cents a copy—$10.00 for 100 copies, down to 3 cents per copy in larger quantities. Single copy free. For full information, write PICTORIAL MEDIA, INC., Attention: Paul Wheeler, 205 E. 42nd ST., NEW YORK 17, N.Y.

What's behind the Euclid name?

Availability on the Job . . .

MORE LOADS PER HOUR
•
MORE PROFIT PER LOAD

Simple design and rugged construction of Euclids assure profitable performance year after year on tough jobs. "Eucs" have earned their reputation for job availability — continuous operation, less down time and lower maintenance costs on a wide range of mine, quarry and construction work.

Available, too, are stocks of genuine Euclid replacement parts and efficient service from the world-wide Euclid Distributor organization.

For assistance with your off-the-highway hauling problems and Euclid performance data on work similar to yours, get in touch with your Euclid Distributor . . . or write direct if you prefer.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

Steel

BULWARK OF FREEDOM BUT . . .

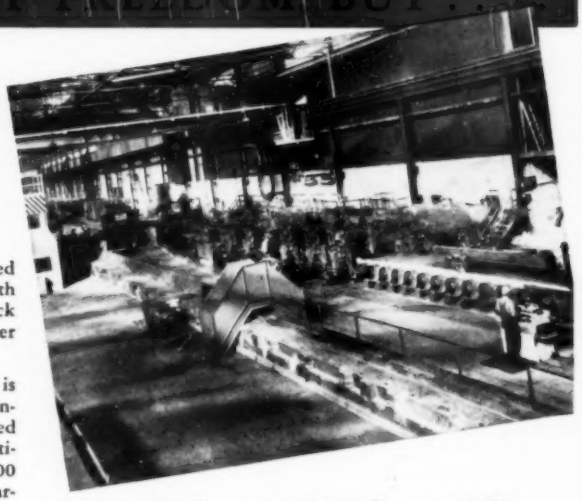
Vulnerable to Socialistic Rust!

Urged on and on by the incentives afforded by our free enterprise system—Americans, with the private money of thousands of stock holders, have built a Bulwark of Steel greater than all the rest of the world.

The capacity of America's steel industry is so great that in 24 hours, it can turn out ingots and castings sufficient to provide finished steel for—500 airplanes, 500 tanks, 1,000 anti-aircraft guns, a half million 3-inch shells, 1,000 howitzers, 2,000 aerial bombs, 1 aircraft carrier, 2 heavy cruisers, two cargo ships, two tankers, 1,000 freight cars, 2,000 trucks, 12,000 automobiles, 20,000 refrigerators, 20,000 stoves, 2,000 homes, and still have 23,000 tons of steel for other purposes.

Remove the incentives of free enterprise or burden it with excessive restrictions and our magnificent steel industry will be vulnerable to the wasting erosion of socialistic rust.

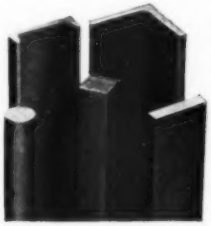
SHEFFIELD STEEL CORPORATION
HOUSTON KANSAS CITY TULSA
SUBSIDIARY OF ARMCO STEEL CORPORATION



Most Modern of Merchant Mills

On this highly mechanized 12-inch merchant mill, steel billets are more efficiently rolled into a wide variety of merchant shapes and sizes vital to manufacturing.

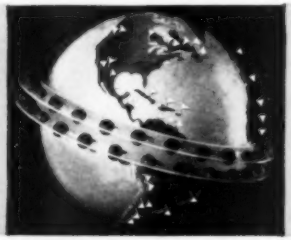
It is a typical example of the continuing modernization and expansion program of Sheffield Steel which, in the last ten years alone, has more than tripled the at-home steel making capacity of Sheffield Steel mills. New furnace and blooming mill capacity now under construction will enable Sheffield Steel to continue to pace industrial progress with an ever increasing supply of steel—the vitamin A of industrial growth.



SHEFFIELD MERCHANT STEEL

There are few industries that do not use merchant steel. Sheffield Steel mills roll a wide variety of bars and shapes.

SHEFFIELD
MOLY-COP
TRADEMARK REG.
COPPER-MOLYBDENUM-ALLOY
Grinding Balls



USED AND PROVED ALL AROUND THE WORLD

Sheffield Products: Carbon and Alloy Steel, Ingots, Blooms, Billets, Plates, Sheets, Hot Rolled Bars, Steel Joists, Structural Shapes, Reinforcing Bars, Welded Wire Mesh, Wire Products, Wire Rods, Fence, Spring Wire, Nails, Rivets, Grinding Media, Forgings, Track Spikes, Bolt and Nut Products

Export Representative: ARMCO INTERNATIONAL CORPORATION • Middletown, Ohio

MORE SCRAP MEANS MORE STEEL • TURN YOURS IN TODAY!

IT COSTS LESS TO OWN THE BEST!

View From Kiln Feed Platform Between The Kilns

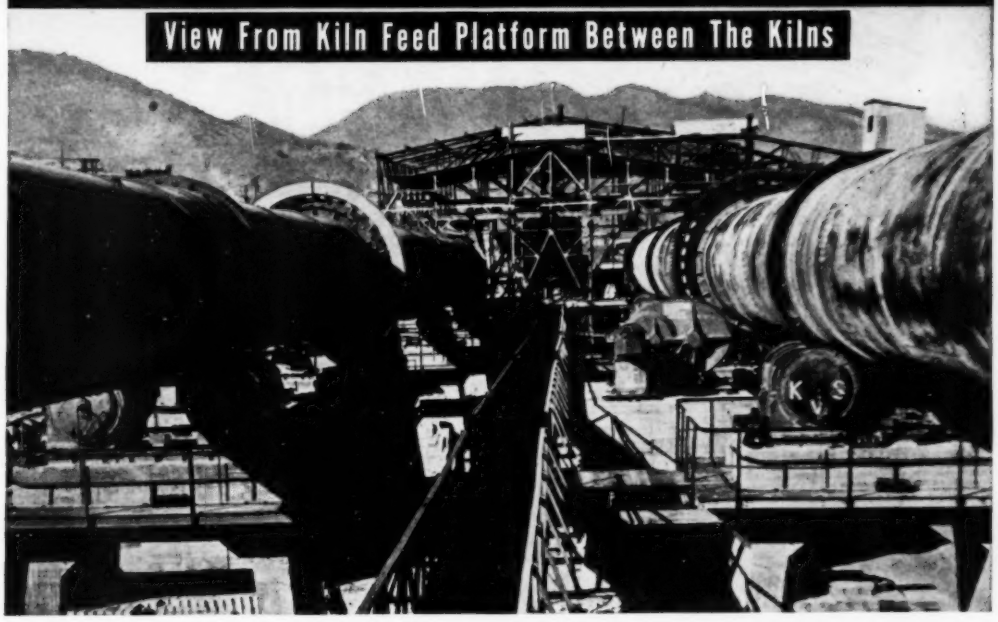


ILLUSTRATION SHOWS TWO LARGE KVS KILNS WITH SELF-ALIGNING BEARINGS

CAPACITY UNLIMITED!

KENNEDY KILNS ARE BUILT TO LAST

featuring:

ALL-WELDED SHELLS WITH SPECIAL THICK SECTION UNDER TIRES

CARRYING ROLLERS MOUNTED IN OVERSIZE SELF-ALIGNING BEARING TO GIVE LOW SPECIFIC BEARING PRESSURE.

Let a KVS engineer review your plant needs and recommend the proper design and size kiln to meet your needs. Long life and dependable service distinguish all KVS products. It's the users who say "It Costs Less To Own The Best."

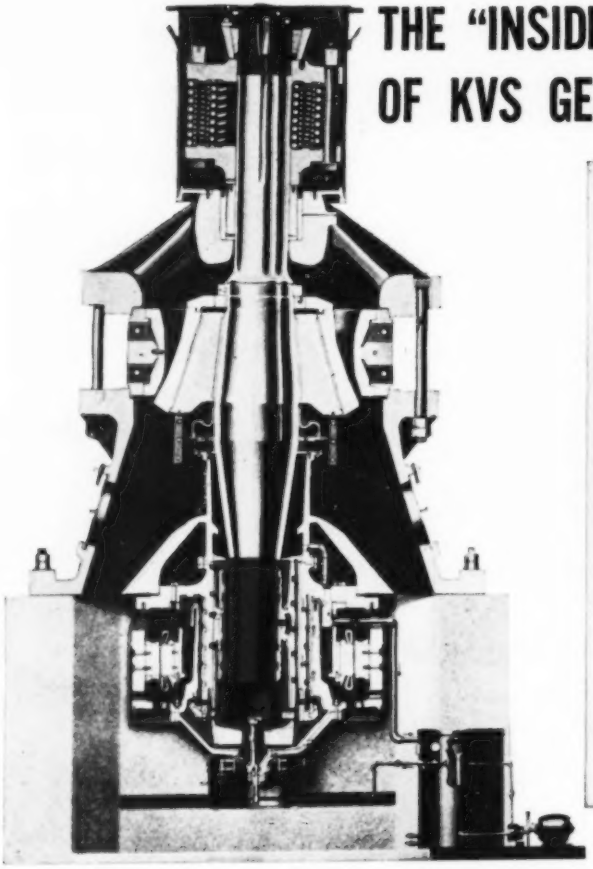
Send for bulletin describing KVS Kilns, Coolers & Dryers

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y. **FACTORY: DANVILLE, PA.**

IT COSTS LESS TO OWN THE BEST!

THE "INSIDE STORY" OF KVS GEARLESS CRUSHERS



CUTAWAY DRAWING OF ROLLER BEARING TYPE "S" CRUSHER

The oiling system is the heart of every crusher. When it fails, bearings burn out . . . weeks of valuable time are lost in making replacements . . . work stops . . . and so does income! KVS offers the solution to this ever-present problem with their positive oiling system. Built without "gimmicks" and trick safety devices that all too often fail to work, this system is virtually fool-proof.

A simple gear pump draws oil from a serpentine cooled tank and, under pressure, pumps it through a filter to a compartment below the ball socket bearing. Oil is then forced UP between this bearing and the shaft and overflows to the eccentric and pulley bearings. This floods the roller bearings, and the oil then overflows into the storage tank. A bypass releases the pressure back into the storage tank, thus maintaining a constant and even flow at all times.

It has been proved through countless tests and is, today, the "Heart" of the famous Kennedy Gyratory Crushers. It provides a system that oils vital parts without failure and without depending on someone's memory.

IT'S CORRECTLY DESIGNED TO LAST FOR YEARS

The oiling system in the Kennedy Gearless Crusher is perfect. Approximately 4 barrels of oil per hour are constantly pumped through the bearings and there is no waste—no spillage of oil. It is the most perfect oiling system that was ever put on a crusher. These crushers have been known to run for many years without renewals to the eccentric.

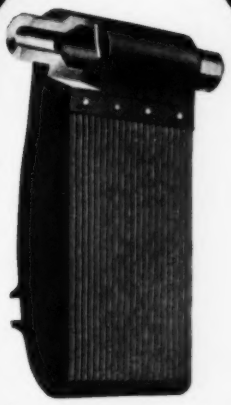
Send for engineering bulletin describing this system

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

[illegible] FACTORY: DANVILLE, PA.

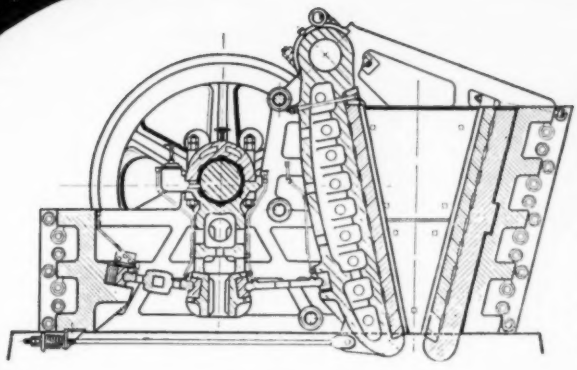
IT COSTS LESS TO OWN THE BEST

KENNEDY SWING JAW CRUSHERS



Reversible Swing Jaws hold wear to an absolute minimum. Hard — Tough — Strong

POWER-PACKED, RUGGED BUILT TO CRUSH AND TO LAST!



Scale drawing of Kennedy Swing Jaw Crusher.

Built with crusher openings from 7 inches to 66 inches . . . 6,000 to 600,000 lbs.

Frames of Herculite steel with tensile strength up to 60,000 lbs. per square inch.

BUILT TO YOUR SPECIFICATIONS IN ANY SIZE REQUIRED

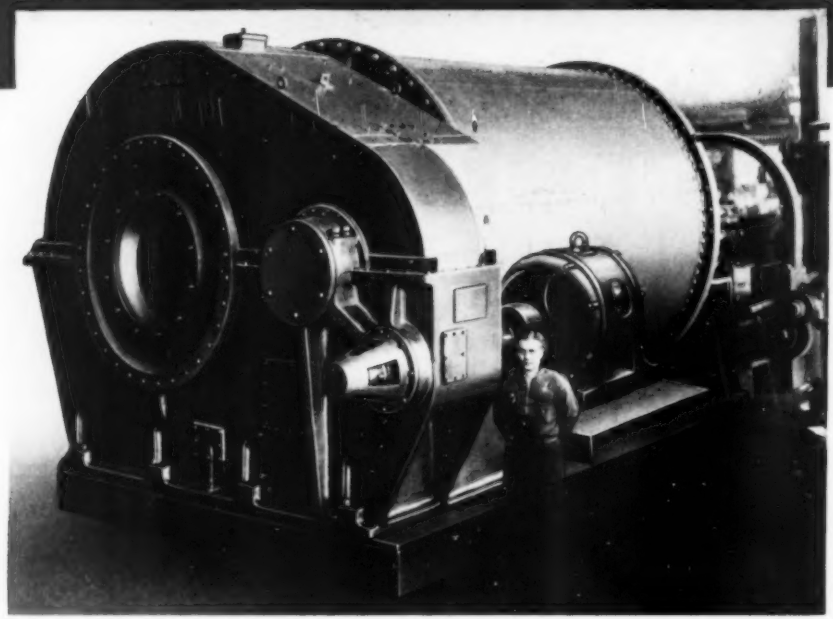
Send for bulletin describing KVS crushers

KENNEDY-VAN SAUN MFG. & ENG. CORP'N

TWO PARK AVENUE, NEW YORK 16, N. Y.

FACTORY: DANVILLE, PA.

IT COSTS *LESS* TO OWN THE BEST!



FEATURES

Hourly capacity:
21 tons — 112 barrels

•

Fineness:
With 200-mesh, 98.7% minus
With 325-mesh, 94.1% minus

•

Specific surface, 2100

•

800 HP synchronous motor uses only 750 HP

•

Exhausters equipped with 200 HP motors using only 145 HP

•

Above capacities obtained with clinker ranging in size up to 2"

Specifications of all types of KVS Mills available on request.

KENNEDY 10' x 18' AIR SWEPT TUBE MILL FOR CLINKER GRINDING

Marked economy of operation distinguishes the new Kennedy 10′ x 18′ Air Swept Tube Mill. Its large capacity, speed and low power consumption shown in the adjoining box invite comparison.

Designed for either raw or finish grinding, this mill reduces clinker to a fineness of 98.7% minus through 200-mesh with minimum power consumption . . . it's a TOP rating.

Exclusive KVS built-in features include integral gear drive connected directly to drive shaft; shaft carried in roller bearings cannot be misaligned; all gears and bearings automaticlly oil sprayed.

In design and construction this is the most modern tube mill on the market. In use all over the world, it is proving its worth under every operating condition. Users say, "It Costs Less To Own The Best" when you specify KVS.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

TWO PARK AVENUE, NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

"I haul rock for only 4¼¢ a mile!"

—says FLOYD WARD, Sidney, Iowa

IOWA
Report No. 6993

FORD TRUCK ECONOMY RUN

"My F-7 Ford Dump has less breakdowns and repairs," says Mr. Ward. "In rough going you can't beat Ford for gas, oil and repair economy!"

"In our fleet Fords stand up better and have more power than other trucks of the same tonnage," Ward says. He entered a 1950 Ford F-7 in Ford's big Economy Run and states:

"During the 6-month Run, our Ford F-7 traveled 23,068 miles. Loads averaged 14,000 lbs. We spent $973.89 for gas, oil, maintenance and repairs, including $260 for 3 new tires. That's a thrifty cost of only 4.22c a mile!"

Like others who rely on Ford for low running costs, you can be sure of money-saving service from your local Ford Dealer. For more facts on the trucks that last longer *and* save you money every mile—mail coupon below.

This Ford F-6 Dump for '51 is also a favorite with construction haulers. Power choice of 3 great truck engines . . . 100-hp. V-8, 110-hp. Big Six and 95-hp. Six. Available with the 5-STAR Cab or, at additional cost, the 5-STAR EXTRA Cab for more efficient driving, safety and convenience. Single speed rear axle standard, 2-speed axle also available (at extra cost) . . . with wide range of ratios for operating flexibility.

Availability of equipment, accessories and trim as illustrated is dependent on material supply conditions.

POWER PILOT HELPS CONSTRUCTION MEN HOLD DOWN HAULING COSTS

The Ford Truck Power Pilot is a simpler, fully-proven way of getting the most power from the least gas. It is designed to synchronize firing *twice* as accurately.

You can use regular gas . . . you get no-knock performance. Only Ford in the low-price field gives you Power Pilot Economy.

FORD TRUCKING COSTS LESS

because FORD TRUCKS LAST LONGER!

Using latest registration data on 7,318,000 trucks, life insurance experts prove Ford Trucks last longer!

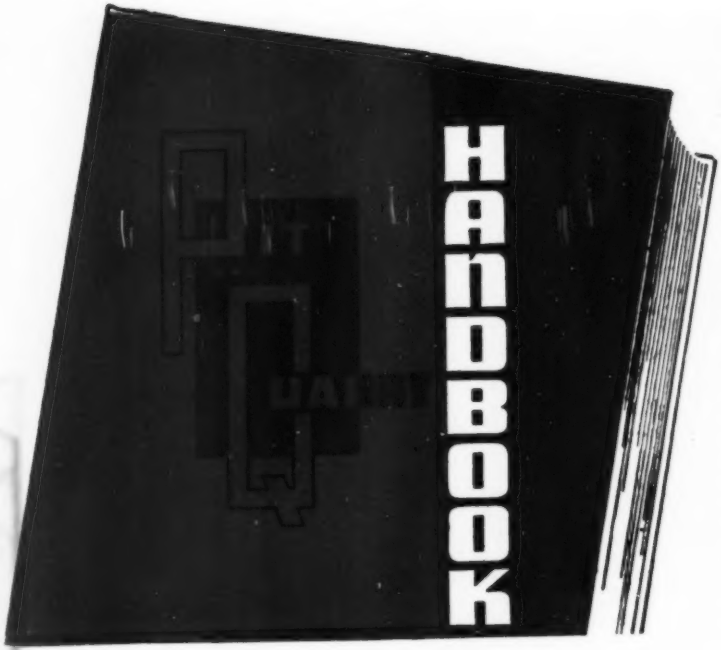
MAIL THIS COUPON TODAY!

FORD Division of FORD MOTOR COMPANY
3253 Schaefer Rd., Dearborn, Mich.

Send me without charge or obligation, detail specifications on Ford Trucks for 1951.

Full Line ☐ **Heavy Duty Models** ☐
Light Models ☐ **Extra Heavy Duty Models** ☐

Name _____
(Please print plainly)
Address _____
City _____ Zone ____ State ____
Check here if Student ☐



An Indispensable Tool For Both Operator and Supplier of Equipment

The pit-and-quarry industries, in providing important basic raw materials, bear a large share of the responsibility for the success of America's industrial effort. For the producer the revised Technical Section of the 1951 Handbook provides a ready answer for many of his operating problems. For the concern supplying him with the machinery and equipment necessary to produce his materials, the 1951 Directory Section provides an accurate, up-to-the-minute list of all known producers of nonmetallic minerals and their products. No effort or expense has been spared to make the new Directory an efficient and highly useful source of information about producers. The number of changes made in the 1951 edition runs into the thousands.

1951 Edition—Order Now

Directory Section listings appear two ways — (1) alphabetical by companies, (2) geographical by plants. You get company names, officers, location of plants, their capacity, and the names of the men who do the buying.

- 928 PAGES
- 27 CHAPTERS
- AUTHORITATIVE
- 15,000-NAME DIRECTORY
- COMPLETELY INDEXED

Order NOW! Use the handy coupon below.

Pit and Quarry Publications
538 South Clark Street, Chicago 5, Illinois

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Please send me

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—copies of the 1951 Directory bound separately at $15.00

☐ Check is enclosed

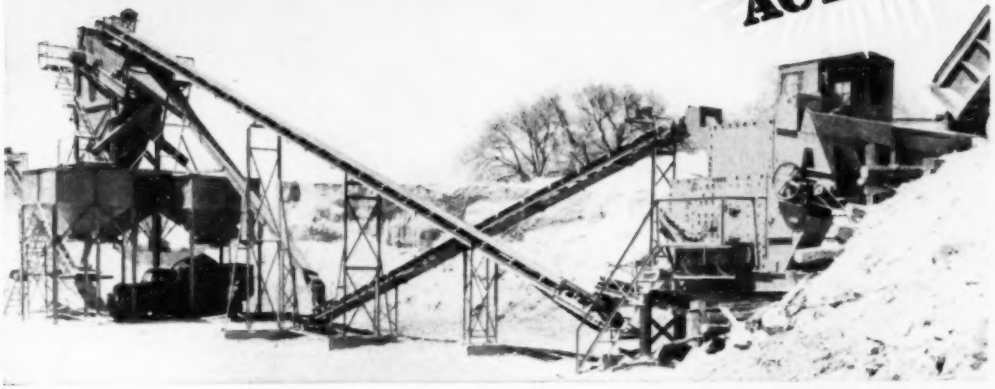
☐ Mail me the bill

Name ..... Title .....

Company .....

City ..... Zone ..... State .....

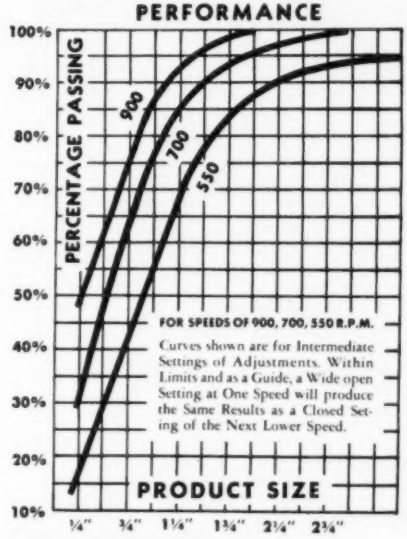
MAXIMUM PRODUCTION OF WANTED SIZES WITH CONTROLLED IMPACT ACTION



AN IMPORTANT ADVANTAGE OF THE PMCO IMPACT MASTER

Operating a single 3240 Impact Master in a closed circuit set-up is mighty profitable for Dillon, Sharpe & Company, Columbus Junction, Iowa. In a free running operation they are averaging 28% of —1½ plus ¾, 38% of —¾ plus #4, and 34% aglime. By making simple adjustments on the Impact Master the percentage of sizes can be increased or decreased to meet demands. That's real flexibility. And what's more, when top production is required, the potential is there to produce over 225 tph.

Controlled Impact Action is the exclusive operating principle of the PMCO Impact Master. It makes possible a ratio of reduction that eliminates much accessory equipment, cuts power, labor and maintenance costs . . . and enables you to step into big production with a minimum investment. By controlling the in-fed rock and directing its flow practically 100% of the breaking is accomplished by rigidly mounted rotor hammers, producing a highly uniform gradation cubical product in one fast operation. Impact Masters are available with capacities to 500 tph. Get more facts and job proved figures. Write today for full information.



PETTIBONE MULLIKEN CORPORATION

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Get ready for the long haul–get your
Free TRUCK SAVER *Inspection NOW!*

- **Open to all International Truck owners**
- **No charge, no obligation for complete 99-point checkup**
- **Free offer expires September 30, 1951**

If you want to make it easier to get peak efficiency from your International Trucks in an uncertain future, get your free Truck Saver Inspection now.

This Truck Saver Inspection is the first step toward warding off trouble in the uncertain months ahead. It can save you dollars now and could save you many more in the months ahead.

And the best part of it is that it doesn't cost you one penny. During the 90-day period ending Sept. 30, you can get your Truck Saver Inspection free of charge.

So if you want to protect yourself, make an appointment with your International Truck Dealer or Branch. Get your Truck Saver Inspection, get complete details on how the complete new International Truck Saver Plan can save you time, trouble and money.

Look what the complete International Truck Saving Plan offers

The complete International Truck Saver Plan has been developed by experts, after a thorough study of today's truck operating problems. It offers these benefits to International Truck operators:

1. Better performance over a longer truck life: trucks are kept in shape to do the most efficient job possible until they can be replaced by new units.

2. Delays minimized in getting new parts: by anticipating future requirements, the demand for needed parts can be accurately estimated.

3. Maintenance costs cut, down time reduced: by preventing major breakdowns, a big saving is effected in both time and money.

4. Truck value maintained: trucks kept in the best possible condition are worth more when it's time for replacement.

Start getting your Internationals in top shape for the future

Thousands of International Truck owners have already begun putting the International Truck Saver Plan to work for them.

Call your International Truck Dealer or Branch and arrange for a free Truck Saver Inspection. You'll get complete information on how the plan can keep your trucks rolling at peak efficiency.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks
Industrial Power . . . Refrigerators and Freezers

International Harvester Company • Chicago

INTERNATIONAL TRUCKS

Heavy-duty engineered for the long haul

CHAINS and SPROCKETS

General purpose Chains for use on high-production units in the Industrial and Construction fields . . . shovels, rollers, conveyors, bucket elevators, drilling rigs, and for drives.

Jeffrey Chains and sprockets will keep your equipment operating at its best. They have a long and consistent record for lowering material handling costs . . . have quite a reputation for thrifty performance and enduring reliability.

Demand high-quality Chains and Sprockets . . . the kind that Jeffrey builds.

Send for catalog No. A418.

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ESTABLISHED 1877
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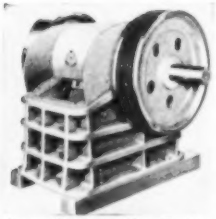
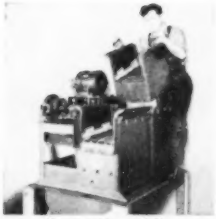
Complete Line of Material Handling, Processing and Mining Equipment



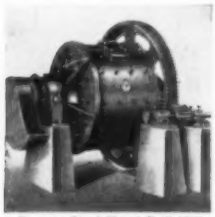
Denver Force Feed Jaw Crusher



Denver Mineral Jig

Denver Cross-Flow Classifier

Denver "Sub-A" Flotation Cells



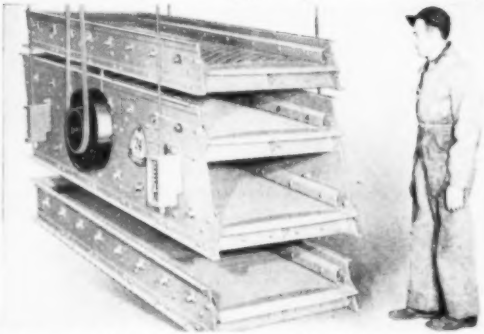
Denver Steel Head Ball Mill

Denver Disc Filter

Denver-Dillon Vibrating Screen, Floor Mounted Type Shown

Continuous tests can be conducted at low cost.

Use DENVER-DILLON VIBRATING SCREENS *for Aggregate Sizing*



Decks may be added in the field on Denver-Dillon Vibrating Screens.

Save Up to 50% HP ... due to four point suspension and only two bearing drive. Available in floor or overhead mounting. Drive from either side of machine. "A patented mechanism."

Efficient Selectivity up to 28 mesh ... because of true "floating circle" motion, entire screening surface is utilized without dampening and dead spots.

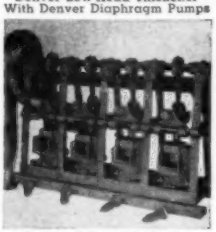
Heavy Duty Construction ... provides for 24 hour operation. Less shut down time means more profit.

Sizes up to 5' x 10' ... These field proven heavy duty screens are available in 2 x 4, 3 x 6, 4 x 8, 5 x 10, and intermediate sizes. Many sizes in stock.

Engineering and Testing Service ... Give us details of your screening and other process requirements. Recommendations will be promptly submitted. Write or wire today!

Denver Agitator and Conditioner

Denver Low-Head Thickener With Denver Diaphragm Pumps



Denver Adjustable Stroke Diaphragm Pump

Denver Vertical Centrifugal Sand Pump

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

"The firm that makes its friends happier, healthier and wealthier"

DENVER EQUIPMENT COMPANY

P. O. BOX 5268 • DENVER 17, COLORADO

DENVER • NEW YORK CITY • CHICAGO • TORONTO • VANCOUVER • MEXICO CITY • LONDON • JOHANNESBURG • RICHMOND, AUSTRALIA

To break rock, you need the right kind of crusher.

this

not this

Same way with trucks. Get one that fits the job!

DODGE "Job-Rated" TRUCKS

are more powerful ...more dependable

To help you transport rock products at lower cost, Dodge builds trucks that are specifically "*Job-Rated*" throughout for pit or quarry operations.

New Dodge "*Job-Rated*" high-tonnage models—2¾ tons and up, including big 6-wheelers—are now more powerful than ever! Thanks to such features as twin carburetion and exhaust system, you get up to 20% more power—with top economy!

With a Dodge "*Job-Rated*" truck you can carry bigger loads of rock, stone, gravel and sand—without overloading springs and axles. It will cost less to operate. It will be *more dependable!* You get new ease-of-handling and new safety, too.

See your Dodge dealer about a dependable truck that's "*Job-Rated*" to move earth and rock at a lower cost.

How Dodge trucks are "*Job-Rated*" for pit and quarry operations

A Dodge "*Job-Rated*" truck is engineered *at the factory* to fit a specific job . . . save you money . . . last longer.

Every unit from engine to rear axle is "*Job-Rated*"—factory-engineered to haul a specific load over the roads you travel and at the speeds you require.

Every unit that SUPPORTS the load—frame, axles, springs, wheels, tires, and others—is engineered right to provide the strength and capacity needed.

Every unit that MOVES the load—engine, clutch, transmission, propeller shaft, rear axle, and others—is engineered right to meet a particular operating condition.

"Job-Rated" TRUCKS DO THE MOST FOR YOU

A NEW METHOD

OF SHORT INTERVAL DELAY FIRING FOR WELL DRILL BLASTS

Du Pont Primacord "MS" Connectors

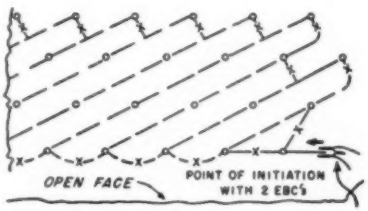
1. **Increase safety by eliminating electric blasting caps.**
2. **Allow unlimited flexibility in planning sequence-firing layouts.**
3. **Greatly simplify the hooking-up operation.**

Du Pont Primacord "MS" Connectors consist of a copper tube 2¾" long containing a delay element that creates an average interval of 16 to 17 milliseconds. At each end of the tube, a 12-inch section or "tail" of Primacord is crimped in place (see sketch at left). These sections are spliced or taped into Primacord trunk lines to provide any desired arrangement of delay firing. Electric blasting caps, either regular or delay, are entirely eliminated from the body of the shot. No caps are needed except for initiation of trunk line, and these are not attached until the shot is ready to fire.

The number of intervals possible is unlimited, and the new "MS" Connectors are readily adapted to a wide variety of blasting layouts. The typical multiple-row drill pattern shown at right provides sequence firing both for individual holes as well as rows. In this arrangement the shot is detonated at the open corner (point of greatest relief) formed by intersection of the face and the free end. Where ends of the shot are tight, the blast can be initiated at the center.

Hook-up operations are simple and fast. Du Pont Primacord "MS" Connectors provide the most convenient and fastest means yet devised for delay firing from the surface.

"MS" Connectors are proving a valuable addition to existing methods of surface initiation and in many cases will replace use of



x *Shows location of "MS" Connectors*

blasting timers and short interval delay electric blasting caps. The Connectors are now available in units of 25, packed in cardboard tube with screw top.

Ask your Du Pont explosives representative for additional information or write for Technical Service Bulletin No. 12. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT EXPLOSIVES
Blasting Supplies and Accessories

A MESSAGE TO AMERICAN INDUSTRY

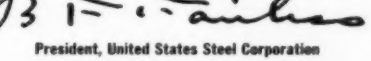
"This is more than a shortage . . . this is an emergency.

Every pound of your scrap is needed, NOW!"

"THE STEEL INDUSTRY is currently operating at more than 100% of rated capacity—turning out well over 2 million tons of steel per week. This record high production—every ton of which is in urgent demand—cannot be kept up unless we get more scrap from every potential source. For without your scrap we cannot produce enough steel. Today, every ton of steel turned out requires a half a ton of scrap for its production. That's why scrap—more scrap—is so urgently needed, and needed right away.

"The fact we have to face today is that steel mills are operating on a hand-to-mouth basis as far as scrap is concerned. Some mills are working on only a two-day supply of scrap. We already have had to shut down steel-making furnaces for lack of scrap.

"That's why we are asking you to strain every effort to get more scrap out of your plants and yards and on its way to the mills . . . to search out the scrap that doesn't come to market in normal times. You'll find this "dormant" scrap in obsolete equipment, tools and machinery that you haven't used for years . . . overlooked in your storage sheds . . . or rusting away in a junk pile in some forgotten corner. It's there. Turn it in at once—*so we can turn out the steel you need.* We can't do it without your help."



President, United States Steel Corporation

USS

UNITED STATES STEEL

UNIFORMLY ACCURATE SIZING

You assure uniform accuracy of sizing when you use Hendrick Perforated Plate on your vibrating and shaking screens. For highly abrasive materials the plate is heat-treated to increase its toughness and minimize wear.

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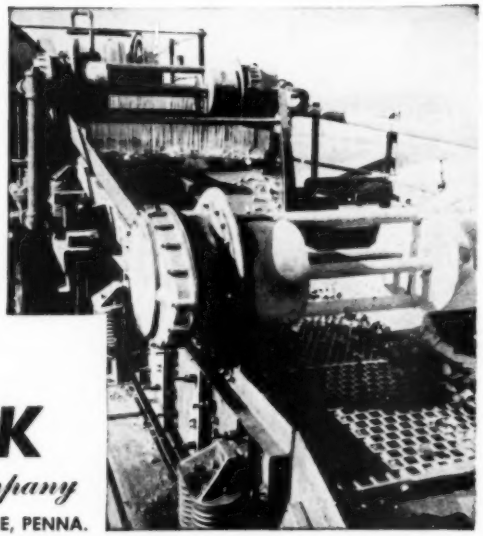

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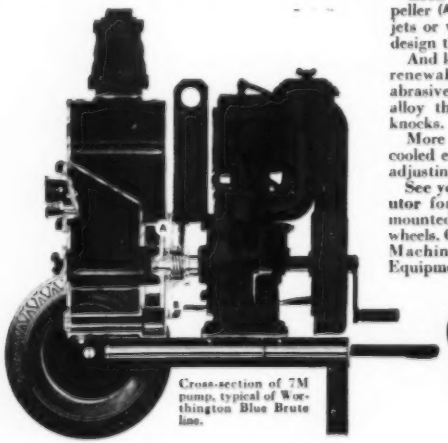

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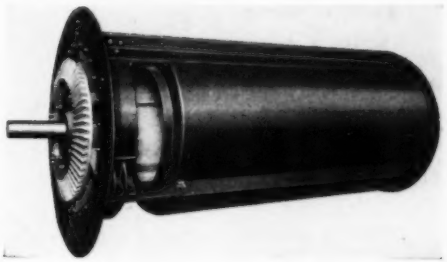
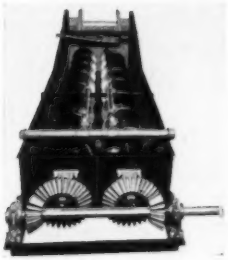


FOR SCOURING ACTION



When clay or dirt cannot be broken up by a revolving scrubber, you'll find a screw washer will usually do the job. In the Link-Belt Screw Washer — both single and double — thrust is taken on a combination radial and thrust bearing at the upper end to keep the shaft in tension. Capacities from 50 to 110 tph.

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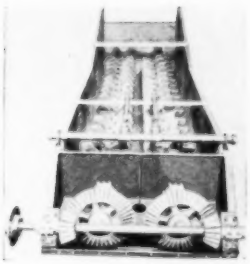

Especially sticky clays must be broken up by a paddle (log) washer. Similar to the screw washer, the Link-Belt Paddle Washer has more violent action. Renewable manganese steel paddles cut up material, in addition to utilizing the grinding action of the particles on each other. Capacities from 25 to 125 tph.

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PIT AND QUARRY

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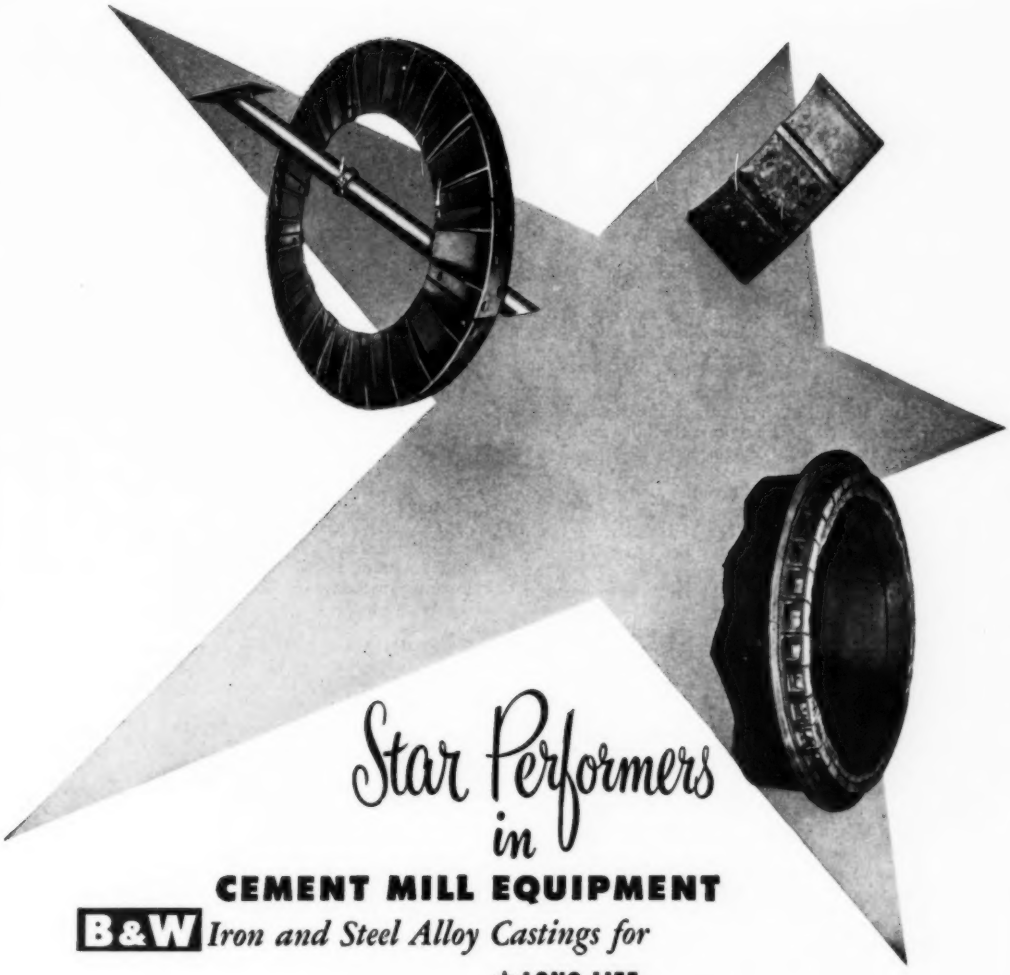

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S-407

editorial

Percentage Depletion Can Be Obtained

PROBABLY all producers of non-metallic minerals who are not now enjoying the benefits of percentage depletion know that, for the third time in three years, there is a possibility that they may be accorded these benefits. In 1949 provisions for percentage depletion for these industries were contained in an amendment to a tax bill. After passing both the House and the Senate this amendment was finally dropped by the Joint Conference Committee of the House and Senate in order to save the bill as the Committee was convinced that if the amendment were retained the bill would face a certain Presidential veto. Again in 1950 the subject of percentage depletion came up on short notice when the House Ways and Means Committee acted to extend percentage depletion to those non-metallic minerals industries not already getting it. This bill also made good progress through the various steps necessary for it to become law but was finally dropped because of the threatening world situation, and possibly also because of the revenue loss involved.

Probably because of the growing realization by members of Congress that the nonmetallic minerals industries now excluded from percentage depletion are vital to our economy in peace or in war, that depletion allowances are necessary to insure an adequate future supply of these materials at reasonable cost, and that discrimination now exists in the application of percentage depletion, another tax bill providing these benefits was brought before Congress early in 1950. This bill, the Revenue Act of 1951, was reported out by the House Ways and Means Committee and was then passed on June 22 by the House of Representatives by a vote of 233 to 160. This tax bill then went to the Senate Committee on Finance which held hearings on its percentage depletion provisions on July 13.

MEMBERS of the trade associations of the interested industries know, and non-members should appreciate, the fact that, as in the previous instances, the cases for their industries were ably presented first to the House committee and again on July 13 before the Senate committee by representatives of these associations. There seems to be reason to believe that the bill will be reported favorably to the Senate about September 1. It would then be voted on by the Senate and, if passed, would then go to a Joint Conference Committee for the adjustment of any differences between the House and Senate versions. The resulting bill would then go to a final vote in both the House and Senate, presumably some time between September 15 and October 1. It would then go to the President for signature or veto.

The trade associations of these industries have done about all they can to bring the benefits of percentage depletion to members of these industries; it is now up to producers to help. These associations have asked their members to support this bill by writing to the two Senators from their State, advising them that they support the statements submitted by representatives of the associations in favor of percentage depletion. Most non-members of these associations have so far been getting a free ride. Percentage depletion is just as important to them as it is to association members and they also should contact their Senators, their Representatives and make clear their attitude. There is still time for such action but the sooner it is taken the more effective it will be as the bill could fail to pass any of the five hurdles still ahead of it. Passage of the bill by an impressive majority might also prevent a Presidential veto.

PERCENTAGE depletion, in case anyone has forgotten, is a public policy of extending to industries with wasting assets some return to encourage the discovery and development of new deposits. It means the return to the owner, tax free, of that part of his capital investment in the mineral reserve in the ground used up by production. The allowance for percentage depletion cannot exceed 50 percent of the net income from the property, computed without allowance for depletion. If percentage depletion is granted to an industry its members will no longer be entitled to depletion based on discovery value. They will, however, be entitled to cost depletion if cost depletion is higher than percentage depletion.

A brief review of the history of percentage depletion may be interesting to some non-metallic minerals producers, if only to remind them of the benefits some competing industries have been and are enjoying. In 1926 percentage depletion of 27½ percent of gross income was established for the oil and gas industries. In 1932 similar provisions were made allowing 5 percent for coal, 15 percent for metal mines and 23 percent for sulphur. In 1942 percentage depletion of 15 percent was allowed for fluorspar, ball and sagger clays, and rock asphalt. Later the same rate was applied to flake graphite, vermiculite, beryl, feldspar, mica, talc, lepidolite, spodumene, barite, thenardite, potash, bauxite, phosphate rock, bentonite and gilsonite.

THOSE industries which would get percentage depletion under this new bill include: Fullers' earth, refractory clay, fire clay, quartzite, perlite, diatomaceous earth, crushed stone, sand and gravel, industrial sand, granite and marble. Some of these industries are directly competitive with some of those already receiving percentage depletion.

It is up to all producers of the above non-metallic minerals to do everything possible to carry on the excellent work already done by their associations in bringing before Congressmen and, in particular, before members of the Congressional Committees the importance of percentage depletion to the future of these important basic industries and the injustice of the present law which accords percentage depletion to certain non-metallic mineral industries while denying it to others. Although prospects are encouraging the path this bill must follow is still a hazardous one. Every producer in these industries should contact his Congressmen at once and make his attitude known.

Walter E. Trauffer

SMIDTH

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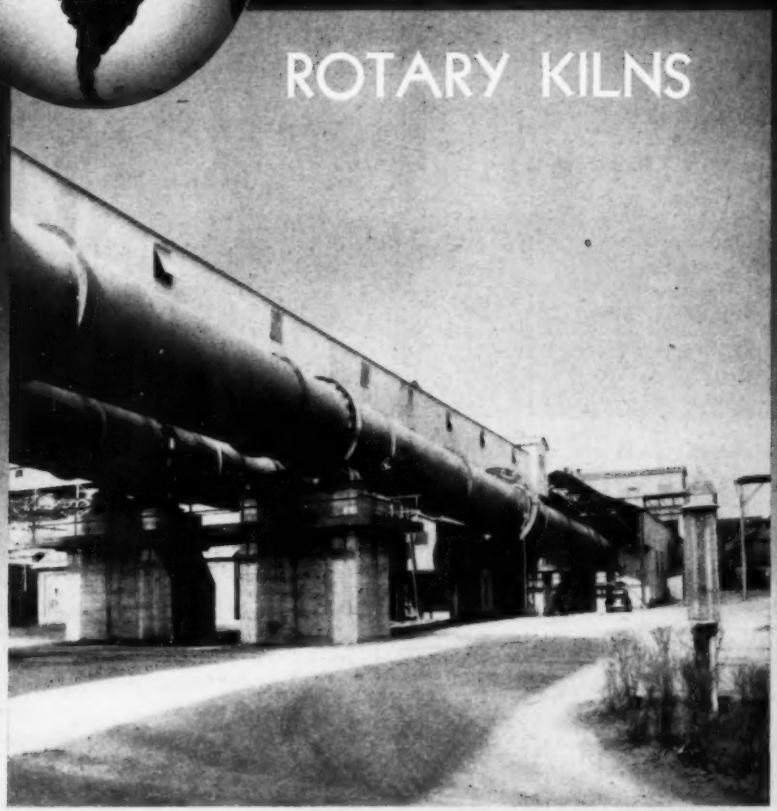

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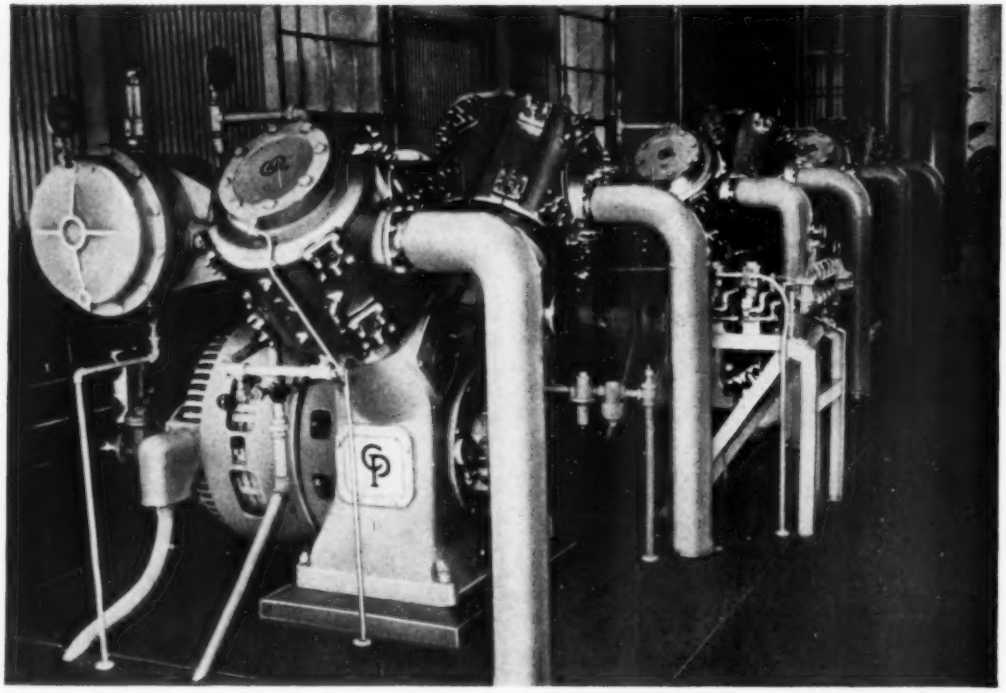

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news of the industry

PIT AND QUARRY

The Nation's Largest Limestone Plant Wins Two Safety Awards

The Rogers City division of the Michigan Limestone and Chemical Company has received two national awards for outstanding safety performances, Joseph A. Valentin, division manager of this company, a U. S. Steel subsidiary, has announced.

The United States Bureau of Mines' "Sentinels of Safety" trophy (See PIT AND QUARRY, July, 1951, pp. 128-131) was awarded to the company's Rogers City plant, the nation's largest limestone operation. This plant has not had a lost-time accident since Oct. 16, 1949. There were no lost-time accidents in the calendar year 1950, in which 1,273,376 man-hours were worked. Consecutive man-hours accumulated since the last lost-time accident totalled 2,185,962 as of June 30, 1951.

Receipt of the award will include the return to this plant of a bronze trophy previously won by the plant in 1929, and for three consecutive years starting in 1932. Each employee of the plant will receive a certificate of honor presented by the Bureau of Mines.

This plant at Rogers City, Mich., also has been awarded a certificate of honor for its achievement in safety by the Joseph A. Holmes Safety association (See PIT AND QUARRY, June, 1951, p. 62), an organization founded in honor of the first director of the Bureau of Mines. Objective of the association is to recognize outstanding safety records in mines, quarries, tunnels, petroleum and metallurgical plants.

Oil Shale Produces Lightweight Aggregate

Expanded shale aggregate is a new product being added to the line of the Delaware Clay Company, Delaware, Ohio. The lightweight aggregate is being experimentally produced by the utilization of oil shale that underlies the company's clay quarry.

The process of expanding the shale includes several new features and was worked out by the company and the Battelle Memorial Institute, Columbus, Ohio. Among the new features are: utilization of the oil content of the shale as the major source of heat, use of a flue-gas-to-air recuperative heat exchanger to preheat combustion air, and use of stokers for sintering the shale.

Plans for commercial operation are being made and the new material should be available within a short time. Modifications of the commercial Westinghouse stoker are being investigated to improve the tonnage produced.

New Plant To Supply Flux Stone for Alcoa

A limestone plant with a capacity of more than 400,000 tons of crushed high-calcium stone yearly is being constructed near Batesville, Ark., by the Love Limestone Co., a subsidiary of the Batesville White Lime Co., Batesville, Ark.

The new plant which will be located about 1½ miles from Penter's Bluff is reported to cost about $1,000,000. The limestone quarry is located near Wolf Bayou. The plant will start supplying stone by April, 1952, to the Alcoa Alumina plant, now being constructed at Bauxite, Ark.

Coming Events

October 8-12, 1951 — Chicago. 39th National Safety Congress and Exposition. Stevens, Palmer House, Congress, Morrison, and LaSalle Hotels.

October 17-19, 1951—White Sulphur Springs, W. Va. Fall meeting. National Industrial Sand Association. The Greenbrier.

November 26-27, 1951—Chicago. Convention of National Association of Silo Manufacturers. Palmer House.

January 15-17, 1952—Washington. Seventh annual convention, National Agricultural Limestone Association. Hotel Statler.

Winners in 1950-51 Slag Safety Contest Announced by N. S. A.

Winners in the National Slag Association Safety Contest conducted by the Bureau of Mines have been announced by E. W. Bauman, managing director of the association.

Based on entries submitted to the Bureau of Mines and on the basis of figures compiled by the Bureau the winner of the contest in Group A (60,000 or more man-hours operation during the year) was Wylam, Ala., open hearth plant of the Birmingham Slag Company with no lost time accidents at the plant in 78,771 man-hours worked during the year.

The Group B winner (less than 60,000 man-hours) was the Donora, Pa., plant of the France Slag Company with a record of no lost-time accidents in 51,275 man-hours of operation during the year.

In addition to the two winners who will receive PIT AND QUARRY Bronze Trophies at the annual meeting of the association, Bureau of Mines Certificates of Safety Achievement will be awarded to the Buffalo Slag Company and the Midland Slag Company in Group A for injury-free records, and to the Callanan Slag and Materials Company and four plants of the Standard Slag Company for similar accident-free records in Group B.

Scottish Firm to Step Up Production of Pyrites

The Scottish firm, Tharsis Sulphur and Copper Company, Glasgow, Scotland, will re-open some of its closed pyrites mines to help relieve the world-wide sulphur shortage.

The company's mines in Spain shipped 539,528 tons of pyrites last year and will re-open some of the abandoned mines and utilize lower grade ores to augment the supply.

A breakdown of the Pacific Portland Cement Company plant at Gold Hill, Ore. for 35 days has caused a cement shortage in southern Oregon according to reports from that area. Some cement has been brought in from Washington at an added cost of a dollar a barrel in freight.

First Half of 1950 Sets All-Time High In Construction Contracts

Another construction record was smashed when contracts awarded in the 37 states east of the Rockies for the first six months of 1951 reached an all-time high of $8,808,109,000.

According to the F. W. Dodge Corporation, construction news and marketing specialists, the new record figure for six months was 29 percent greater than the nearest comparative total of $6,854,148,000 set during the first half of 1950.

This, despite a drop in June of 45 percent from May's all-time monthly record total of contracts awarded. The June figure was $1,408,932,000 compared with the monthly record-smashing May total of over $2.5 billion. The June, 1951, total was still high enough to be 5 percent ahead of the total for June a year ago, according to Dodge.

The first six months of the current year showed all categories, non-residential, residential and public and private works and utilities, percentagewise out in front of 1950, but residential classifications began to show earmarks of defense-limited construction.

In the residential group for six months, hotel buildings were down 36 percent compared with the first half of 1950; dormitories were off 4 percent. However, one-family owner-occupy dwellings at $804 million were less than one percent behind last year's $805 million, and one-family sale-or-rent buildings at $1.630 billion were almost neck and neck with last year's $1.631 billion.

New apartment buildings were up 5 percent for the six-month period over the corresponding period 1950 and two-family dwellings registered a 14 percent gain over the comparative 1950 total.

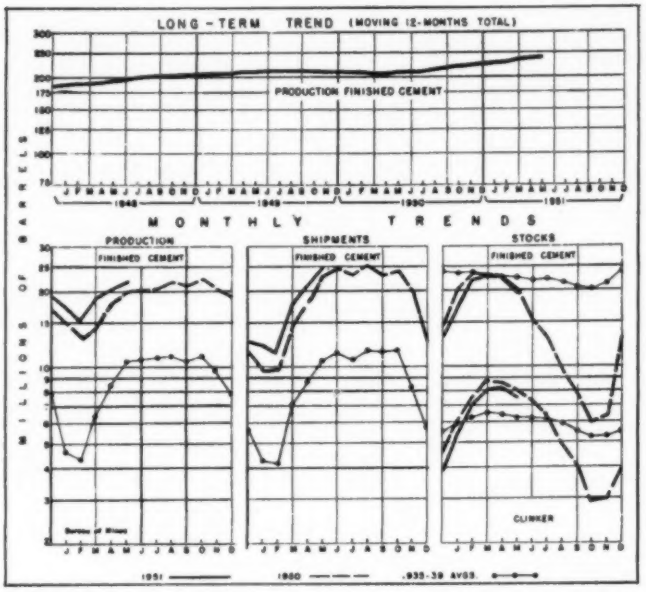
The residential total for six months 1951 was $3,323,727,000 or 2 percent more than the corresponding 1950 figure.

With new manufacturing buildings leading the way with awards for six months this year of over $2 billion, 306 percent ahead of the comparative 1950 figure, the non-residential group registered a 77 per cent increase for six months 1951 over 1950. The total was $4 billion plus, compared with $2 billion plus last year.

Individual classifications for six months showed commercial building up 5 percent over corresponding figures for 1950; educational awards were up 19 percent; public buildings up 14 percent; religious buildings up 11 percent. Hospital building awards were down 4 percent and social buildings were down 51 percent.

Public and private works and utilities for six months totaled $1,417,737,000 or 10 percent more than the corresponding figure for 1950.

In June, non-residential awards were $553,280,000 or 66 percent less than May but 25 percent more than June last year. Residential contracts at $545,152,000 were 18 percent less than May and 13 percent behind June, 1950. Public and private works and utilities at $310,500,000 were 12 percent more than May and 14 percent greater than June a year ago.



SUMMARY:—The output of 21,925,000 barrels of finished portland cement in May 1951, as reported to the Bureau of Mines, Department of the Interior, was 10 percent greater than that reported in May 1950. Mill shipments of 24,894,000 barrels were 9 percent higher than in the same month of 1950, while stocks of 19,394,000 barrels were 3 percent less than at the same time last year. Clinker output during May was up 9 percent over that in May 1950 and amounted to 21,341,000 barrels.

PRODUCTION:—151 plants located in 36 States and Puerto Rico produced 21,925,000 barrels of finished portland cement during the month while 150 plants manufactured 19,941,000 barrels in May 1950. As indicated above, clinker production was up 9 percent over the same month in 1950.

SHIPMENTS:—Mill shipments of finished portland cement increased 9 percent over the total reported for May 1950. Shipments were greater in 16 districts and lower in 3 districts than those recorded for May 1950. The greatest increase was 61 percent in the Puerto Rican district and the maximum decrease was 16 percent in the Kansas district. In general, major producing areas showed modest increases.

STOCKS:—Mill stocks of 19,394,000 barrels of finished portland cement were reported for May 1951 — 3 percent below the May 1950 figure, while stocks of clinker amounted to 7,456,000 barrels — 8 percent below those of the same month in the previous year.

Comic Book Joins Anti-Inflation Fight

To aid the fight on inflation the Bemis Bro. Bag Company is calling attention to the program initiated in its plants. The campaign which is being carried by ads in many leading magazines (see page 39, July Pit and Quarry) tells how a comic book "How Stalin Hopes We Will Destroy America" aided in awakening the employees of the company to the danger of inflation.

This booklet, created for Bemis by Pictorial Media, Inc., 205 E. 42nd Street, New York 17, N. Y., is to be the first of a series dealing with various aspects of inflation and other pressing economic problems.

The Fountain Sand and Gravel Company has moved its sales and general offices to 913 N. Main street, Pueblo, Colo. The former office at the plant site was destroyed by fire recently.

Lawrence Portland Cement Ups Production 50 Percent

Lawrence Portland Cement Company's sales for the first quarter were 50 percent higher than the previous year. The company expects to produce at least 3,380,000 bbl. this year.

The Thomaston, Me., plant is expected to increase capacity about 50 percent while the Northampton, Pa., plant is expected to decrease production somewhat due to retirement of obsolete kilns.

Marquette Cement Manufacturing Co., Chicago, Ill., will make its first public offering of stock soon with an issue of 100,000 shares. Half the shares will be sold by the company and the other half will come from a group of stockholders.

E. Lee Heidenreich Jr., Newburgh, N. Y., consulting engineer, has moved his office to 75 Second Street, in that city. Mr. Heidenreich's office was formerly located at 67 Second Street, Newburgh.

French Representatives Tour U. S. Cement Plants Seeking Production Ideas

Twelve representatives of the French Cement Industry toured the United States recently in order to find out how to increase cement production. French production at present requires twice as many man-hours as comparable output in the U. S.

The tour was sponsored by the Economic Cooperation Administration to aid the French cement industry in increasing production for use in reconstruction projects such as dams, power plants, roads, and other public works. About $3,000,000 worth of cement making equipment has been imported from the United States to increase plant capacity.

The French representatives, which included management, labor and technicians, spent five weeks in discussions with leading authorities in the cement machinery, cement manufacturing, and labor relations fields and in visiting a number of plants for practical instructions.

Among the plants visited were; Universal Atlas Cement Co., New York; G. & W. H. Corson, Inc. Philadelphia, Pa.; Warner Co., Cedar Hollow, Pa.; Allentown Portland Cement Co., Valley Forge, Pa.; Alpha Portland Cement Co., Martins Creek, Pa.; Penn-Dixie Cement Corp., Martin's Creek, Va.; Hercules Cement Corp., Stockertown, Pa.; Fuller Engineering and Cement Co., Allentown, Pa.; Allentown Portland Cement Co., Evansville, Pa.; Traylor Manufacturing and Engineering Co., Allentown, Pa.

Other plants which were on the itinerary included Allis-Chalmers Manufacturing Co., Milwaukee, Wis.; Harnischfeger Corp., Milwaukee, Wis.; Missouri Portland Cement Co., St. Louis, Mo.; and Lone Star Cement Co., Roanoke, Va.

Meetings were held with the Portland Cement Association, Chicago, Ill.; International Union of Cement, Lime, and Gypsum Workers (AFL) Chicago, Ill.; United Steel Workers (CIO) District 7, Philadelphia, Pa.; National Planning Association, Washington, D. C. and various government officials.

The men who visited the United States were headed by Henri Lafuma, manager, Study and Research Center, Lime and Cement Technical Association, Paris. The others were: Roger C. L. Degenne, assistant manager, Poliet & Chausson Co., Pagny, Meuse; Laurent E. H. Feuillet, maintenance mechanic, Societe de Lafarge et du Teil, LeTeil, Ardeche; Fernand B. M. Fontanarava, forman, same company, Valdonne, Bouches-du-Rhone; Roger Frinault, assistant laboratory engineer, Poliet & Chausson Co., Gargenville, Seine-et-Oise; Jean de Junneman, engineer in charge of central laboratory, same company, Paris; Robert Kallmeyer, manager, Societe des Chaux et Ciments du Haut Rhin, Altkirch, Haut Rhin; Jacques G. Monroy, forman, Poliet & Chausson Co., Beaumont, Seine-et-Oise.

Georges C. Morel, in charge of rotary kilns, Poliet & Chausson Co., Beaumont, Oise; Mathieu Piquepaille, forman, Societe de Lafarge et du Teil, LaCouronne, Charente; Jean J. Rives, engineer, same company, Contes, Alpes-Maritimes; and George E. Tire, engineer and assistant manager, Poliet & Chausson Co., Gargenville, Seine-et-Oise.

State Supreme Court Upholds $67,000,000 Washington Bonds

Constitutionality of the $67,000,000 highway bond issue legislation enacted by the 1951 Washington State Legislature was recently upheld by the State Supreme Court.

In an opinion written by Associate Justice Thomas E. Grady, the high state court declared: "We conclude that the act conforms with provisions of the constitution which respondents urge have been violated and that the bonds authorized thereby should be issued and sold in accordance therewith."

To be retired by revenue from state gasoline taxes, the bond issue was authorized to finance construction of four major highway and bridge projects and to make Agate pass bridge toll free. Projects to be financed with the bond money are: Completion of improvements on U.S. 99 from Oregon to Canada, making it a four-lane highway virtually all the way; construction of four traffic lanes across Snoqualmie Pass; building of farm-to-market roads in three Columbia Basin counties, and construction of a new bridge across the Columbia River between Pasco and Kennewick.

The Ryolex Corporation, Champaign, Ill., has opened a plant for the production of perlite lightweight aggregate. Production is at the rate of 400 4-cu. ft. bags daily. Leo O'Neill is president of the firm.

The Zonolite Company, Chicago, Ill., reported a record high income for the fiscal year ending March 31, of $775,905. This was 20 percent above the previous year. Sales were $6,270,063 for the year —a 35 percent increase.

During the year two new plants were opened and the Southern Zonolite Company added three.

This month's cover picture shows the quarry and plant of the Somerset Crushed Stone Co., Inc., at Bernardsville, N. J. One of the well drills is visible on the ledge in the right foreground, while to the left and below it one of the 2-cu. yd. shovels may be seen. A complete description of the quarry and plant appears in this issue.

Cement Advisory Group Asks NPA to Spread D.O. Orders Equitably

The Cement Industry Advisory Committee, which met on June 28, 1951, asked the National Production Authority, U. S. Department of Commerce, to issue an order whose aim will be to spread defense rated orders equitably among industry members.

Some cement producers, particularly those in all coastal areas, report that their entire production goes into filling of DO orders since defense demands for cement are increasing. They reported that this prevents them from taking care of their normal customers who do not carry DO ratings.

Though the industry's production is close to capacity, demands still exceed supply, the committee explained. The present production rate cannot be maintained indefinitely, NPA was advised.

An NPA official told the committee that cement consumption for the first five months of this year was nearly 12 million barrels more than during the comparable period in 1950. He predicted, however, that due to a shortage of structural steel for construction, the amount of cement consumed for the remainder of 1951 will be slightly reduced.

Although the availability of structural steel may seriously affect consumption of cement for construction, industry members believe that cement shipments will be equally as high in 1951 as they were in 1950.

An order limiting production of certain types of cement to save critical materials is not necessary at this time, the committee declared. Most producers have voluntarily reduced production of less essential types, it was reported.

Such an order will be desirable, however, if military and industrial demands increase appreciably, the committee said. Should this occur, a recommendation was made that the entire committee serve as a task group to study conservation measures.

The committee was informed that multi-wall paper shipping bags are expected to continue in short supply. The industry was urged to keep inventories of these bags at a reasonable level.

John L. Haynes, Director, NPA's Building Materials Division, presided.

These committee members attended: Arthur E. Hjerpe, General Portland Cement Co., Chicago, Ill.; Ellroy King, Halliburton Portland Cement Co., Corpus Christi, Tex.; D. S. MacBride, Hercules Cement Corp., Philadelphia, Pa.; Oris Dobbins, Ideal Cement Co., Denver, Colo.; John C. Bowen, Lehigh Portland Cement Co., Allentown, Pa.; J. F. Nevlan, Lone Star Cement Corp., New York, N. Y.; H. L. Berno, Medusa Portland Cement Co., Cleveland, Ohio; D. S. Colburn, Marquette Cement Mfg. Co., Chicago, Ill.; M. Moss Alexander, Missouri Portland Cement Co., St. Louis, Mo.; W. A. Marsh, Permanente Cement Co., Oakland, Calif.; Garner A. Beckett, Riverside Cement Co., Los Angeles, Calif., and George H. Reiter, Universal Atlas Cement Co., New York, N. Y.

A.S.T.M. Elects Officers At 54th Annual Meeting

At the American Society for Testing Materials' recent 54th Annual Meeting in Atlantic City, N. J., the following officers and directors were elected:

Truman S. Fuller, elected president, is the engineer in charge of Works Laboratory, General Electric Company, Schenectady, N. Y. He has been active in A.S.T.M. as a director and a member of numerous committees including those investigating steel, corrosion, and fatigue of metals.

Leslie C. Beard, named vice president, is assistant director of Socony-Vacuum Laboratories, Socony-Vacuum Oil Company, New York City. Dr. Beard has been active in petroleum investigations for A.S.T.M. including gasoline, turbine oils, and flow properties of oil.

New directors included: John W. Bolton, director of metallurgical research and testing, The Lunkheimer Company, Cincinnati, Ohio; Rudolph A. Schatzel, vice president and director of engineering, Rome Cable Corporation, Rome, N. Y.; E. O. Slater, president and manager, Smith-Emery Company, Los Angeles, Cal.; F. P. Zimmerli, chief engineer, Barnes-Gibson-Raymond Division of Associated Spring Corporation, Detroit, Mich.

Stanton Walker, elected a director, is director of engineering, National Sand and Gravel Association, and The National Ready Mixed Concrete Association, Washington, D. C. He is noted, among other things, for his work on several A.S.T.M. Committees including concrete and concrete aggregates, road and paving materials, and mortars for unit masonry. He has been active also as a director and a member of the Committee on Papers and Publications, and in district activities.

Special recognition was awarded to members of industry who have contributed to the work of the society. Ten awards of merit were given—two to members of the non-metallic minerals industries.

William Henry Klein, vice president and operating manager, Lawrence Portland Cement Company, Northampton, Pa., received one of the awards for "outstanding service to the Society for 40 years, notably in Committee C-1 on Cement. As an officer of this committee and as a member and officer of several of its subcommittees he contributed constructively and effectively to the development of both methods of test and specifications for cement."

Stanton Walker also received the award for eminence in the field of concrete and concrete aggregates, where the results of the research he has stimulated for more than 30 years have effectively aided in A.S.T.M. committee work, particularly in Committee C-9 on Concrete and Concrete Aggregates, of which he has been secretary for 15 years. His work throughout has been characterized by recognition of the practical elements

William H. Klein

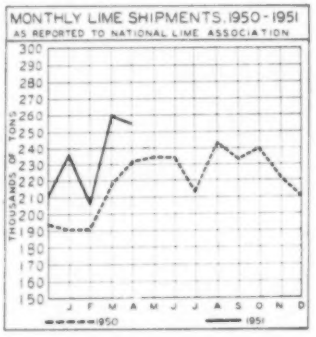
so fundamental to the effectiveness of specifications and methods of testing.

Honorary memberships were awarded to five persons for eminence in technical work and for meritorius service to the organization.

Albert Theodore Goldbeck, engineering director, National Crushed Stone Association, Washington, D. C., was elected for intensive A.S.T.M. work which has involved cement, mortars, soils for engineering purposes, and especially concrete and concrete aggregates. A former officer of the Society, Mr. Goldbeck has written a great many technical papers on investigations in road materials and highway and bridge design.

Harold Hudson Morgan, vice president and general manager, Robert W. Hunt Company, Chicago, Ill., was elected for leadership in the testing of cement, railroad materials (in particular rails and track fastenings) and steel products. Chairman of A.S.T.M. Committee A-1 on Steel for many years, his intensive work here concerned track materials, pipe and tubing, and concrete reinforcement. He is a past-president of the Society.

Frank Erwin Richart, retired research professor of engineering materials, University of Illinois, Urbana, Ill., since deceased, was elected for carrying out research work on many other materials including cast iron pipe, chilled iron car wheels, and concrete reinforcement. A past-president of the American Concrete Institute, he has received several honors and awards for his work in this field.



According to data collected by the National Lime Association, 46 companies in April, 1951, shipped 255,101 tons of lime (156,453 quicklime, 98,648 hydrate). Reporting companies represent 58.9 percent of the association members' total capacity of record. Based on Pit and Quarry's estimate for the remainder of the industry, the total shipments were approximately 493,300 tons. Shipments by uses and grades for April, 1951, were

	Quicklime	Hydrate
Agricultural	7,233	23,449
Building	19,886	46,817
Chemical	129,334	28,382
Totals	156,453	98,648

Lightweight Aggregates Plants Being Built in Kansas

Production of about 600 cu. yds. daily is the goal of each of two new lightweight aggregate plants now under construction near Kansas City and Ottawa, Kan.

Buildex, Inc. is constructing the Ottawa plant which is planning to sinter a shale deposit in the vicinity. It is going to install two 8- by 125-ft. rotary kilns for the process. George K. Mackie Jr., is president of the new company.

Mineral Products Company will build the plant at Kansas City, Kan. It will use Dwight-Lloyd sintering process. Kenneth A. Spencer is president.

Location of the deposits and plant sites were determined by the Kansas State Geological Survey.

Freeport Sulphur Buys Virginia Ore Tract

Freeport Sulphur Company, New York, N. Y., has purchased property in Carroll County, Va., known as "The Great Gossan Lead" from the Virginia Iron, Coal and Coke Company, Roanoke, Va.

The property contains 7,792 acres that are pyrrhotite bearing. It is said that Freeport intends to explore and develop the reserves as a source of sulphur. A total of $1,618,000 was paid for the property.

Expansion at the Des Moines plant of the Marquette Cement Manufacturing Company has been completed. The new 475-ft. kiln was fired recently and the work on the new grinding department has been finished. The work was in progress for 7 months and increased the plant capacity by 50 percent. James H. Howe, superintendent of the Cape Girardeau plant, was in charge of the construction.

The seventh annual convention of the National Agricultural Limestone Association will be held in Washington, D. C., at the Hotel Statler on January 15, 16, and 17, 1952.

$10,000,000 Phosphate Plant to Recover Uranium Compounds

The International Mineral & Chemical Corporation of Chicago, Ill., has announced plans to increase the size of the projected phosphate chemicals plant in Florida. To be known as the Uranium-Phosphate Chemical Plant, the new project will, when completed, produce defluorinated phosphate for the animal feed manufacturing industry, multiple superphosphate for the plant food industry, and will recover uranium compounds as an additional step in its operations.

Located adjacent to International's phosphate mining property near Mulberry, in Polk County, Fla., the new plant will cost approximately $10,000,000, and will produce about 100,000 tons of defluorinated phosphate annually.

In his announcement of the project, International's President Louis Ware stated: "In 1940, International produced and shipped the first carload of its new defluorinated phosphate and it has grown until today it is the largest producer of this animal feed material."

Construction of the plant will be started immediately, with completion expected to take about a year.

RFC Approves $4,500,000 Loan To Carolina Giant Cement Co.

Approval of a $4,500,000 loan to the Carolina Giant Cement Co., of Harleyville, S. C., was announced July 11 by the South Carolina office of the Reconstruction Finance Corp. Purpose of the loan, according to the announcement, is to finance new buildings and to buy and install new machinery and equipment.

It was announced that the loan, in which banks will have 10 percent participation, was approved in the interest of national defense. The interest rate is 5 percent and the loan will mature in seven years.

Security was listed as land, buildings, machinery and equipment, including that to be acquired from loan proceeds, owned by the company and its parent firm, Giant Portland Cement Co., of Philadelphia, Pa.

The company is the nearest cement plant to the Atomic Energy Commission's Savannah River project, which is about 85 miles distant. The RFC announcement said "there appears to be a shortage of cement in this area."

"There are no other cement plants located in North Carolina or South Carolina," the announcement added, "and this company therefore enjoys a geographical advantage over other cement producers."

Moss Bluff Sulphur Output To Be Increased 50 Percent

Plans to increase the capacity of the Moss Bluff Sulphur Mine in Liberty County, Tex., by about 50 percent have been announced by the Texas Gulf Sulphur Company. Application has been made for authority to proceed with the construction and orders for boilers and necessary auxiliary equipment have been placed.

Despite increased production of sulphur from less than 2,000,000 tons a year in World War II to an average of 3,000,000 tons a year over the last two years, the company's supply has decreased. The increased production from Moss Bluff and a new production at the famous Spindletop Dome near Beaumont, Tex., will, company officials hope, make possible some replenishment of the reduced surface stocks of sulphur.

Samuel Omasta Joins N. A. L. A. As Asst. Executive Secretary

Samuel Omasta, formerly assistant to the administrator of the C. M. S. phase of the Agricultural Conservation Program, was appointed assistant executive secretary to the National Agricultural Limestone Association, Inc., on May 7, 1951. He replaced Edward J. Brunenkant Jr., who resigned to accept another position.

Mr. Omasta, a native of Massachusetts, joined his father and brothers in a joint farming operation after his graduation from Dartmouth College in 1931. From 1937 to 1941, he served the AAA Program as a farm checker and community committeeman, in addition to his farming interests, and moving upward from there in 1941 to the Massachusetts State AAA Committee where he was responsible for the procurement and distribution of

Samuel Omasta

materials under the Agricultural Conservation Program.

In 1942, Mr. Omasta transferred to the Department of Agriculture in Washington where he worked in the Northeast Region of the AAA under Robert M. Koch, the present executive secretary of N.A.L.A. When Mr. Koch left the department in 1947, Mr. Omasta directed the procurement and distribution of materials under the program in the Northeast States from the New York State Office at Syracuse. In the later part of 1947, he transferred to the ACP Branch in Washington, D. C., to the position he held previously to his appointment to N.A.L.A.

N.A.L.A. Reports 1950 Farm Use of Aglime Over 29,000,000 Tons

The National Agricultural Limestone Association, 1424 K Street, N. W., Washington, D. C. reported that during 1950 farmers had used the second highest tonnage of limestone in the history of the country. According to an extensive survey of more than 1,000 agricultural limestone producers, the state Extension Services and the Production and Marketing State offices, 29,198,830 tons of agricultural liming material were used in 1950. Only in 1947 when 30,282,902 tons were applied was more agricultural liming material used.

The following is the tonnage of agricultural limestone used by states in 1950:

Alabama	191,763
Arkansas	117,854
California	22,870
Connecticut	73,240
Delaware	51,992
Florida	188,653
Georgia	311,261
Idaho	9
Illinois	4,985,397
Indiana	2,856,342
Iowa	3,502,516
Kansas	727,415
Kentucky	1,197,276
Louisiana	103,641
Maine	72,124
Maryland	345,297
Massachusetts	66,283
Michigan	720,342
Minnesota	467,788
Mississippi	297,346
Missouri	3,101,463
Montana	140
Nebraska	31,274
New Hampshire	38,963
New Jersey	182,474
New Mexico	15
New York	722,678
North Carolina	428,522
Ohio	2,204,173
Oklahoma	395,275
Oregon	86,346
Pennsylvania	1,319,314
Rhode Island	11,309
South Carolina	155,263
Tennessee	688,340
Texas	72,158
Utah	12
Vermont	105,427
Virginia	960,480
Washington	25,296
West Virginia	277,483
Wisconsin	2,075,626
Wyoming	17,390
Total	29,198,830

Jefferson Lake Sulphur Company has started production at its Stark's Dome property in Calcasieu Parish, La. The firm expects to bring in production at the rate of 100,000 tons annually.

Hercules Cement Corporation reported an increase of 15 percent in shipments of cement for the first half of the year compared with 1950.

N.L.A. Operating Meeting To Hear German Speaker

The program for the National Lime Association's operating meeting have been announced by Robert S. Boynton, general manager of the association. The program, which is one of the most varied and interesting in recent years, was arranged by John Andrews, Kelley Island Lime and Transport Company, program chairman.

The meeting will be held September 10, 11, and 12 at Heaton Hall, Stockbridge, Mass., and will be restricted to representatives of member companies, invited guests.

One of the highlights of the meeting will be an address by Hermann Lange, president of the German Lime Manufacturers Association, and president also of one of the prominent German lime companies. This will be the first time in about 20 years that there has been an exchange of ideas between the German and the American lime industries. Several leading representatives of the German lime industry will accompany Mr. Lange on his trip to the meeting.

Visits to some of the large lime plants in the Massachusetts—Connecticut area and inspection of some of the newest methods will occupy much of the time.

The tentative program follows:

MONDAY, SEPTEMBER 10

8:30 a. m. Registration—Heaton Hall, Stockbridge, Mass. C. C. Loomis, president, New England Lime Company, presiding.

10:00 a. m. **Current German Lime Production Methods and New Developments,** Hermann Lange, president of the German Lime Manufacturers Association.

11:00 a. m. **New Design Down Draft Lime Kiln,** F. G. Schwabe, president, Toledo Engineering Company.

11:45 a. m. Election of 1951 NLA Operating Division program chairman.

12:00 noon Adjourn for lunch.

2:00 p.m. **Rotary Blast Hole Drill** (Its comparative cost), L. E. Smith, Kelley Island Lime & Transport Company.

2:30 p.m. Blasting Session conducted by DuPont engineers.

3:00 p.m. Brief Explanation of Fluo-Solids Kiln and Dryer.

3:30 p.m. General Lime Burning Discussion Session.

TUESDAY, SEPTEMBER 11

8:00 a. m. Plant visitation trip to New England Lime Company's, Adams, Mass., plant. (Principal feature will be to witness the large capacity Fluo-Solids kiln and dryer in operation, one of the largest capacity material kilns in the world.)

12:00 noon Lunch.

John Andrews, N.L.A. Program Chairman

2:00 p.m. Plant visitation trip to New England Lime Company's, Canaan, Conn., lime and magnesium plant.

WEDNESDAY, SEPTEMBER 12

8:30 a. m. Plant visitation trip to the Lee Lime Corporation, Lee, Mass. (Principal feature will be the Kennedy Van Saun Rotary Kiln Preheater in operation as well as a blasting demonstration at 10:30 a.m. by DuPont engineers at the Lee Lime Corporation quarry.)

12:00 noon Golf at Stockbridge Golf Club, Stockbridge, Mass. (tennis, horseshoes, and other activities available for non-golfers).

7:00 p.m. A real New England Clam Bake (with lobsters and all of the trimmings), Stockbridge Golf Club.

Monsanto Plans Phosphorus Plant, Leases Idaho Acreage

Monsanto Chemical Company, phosphate division has obtained leases from the J. R. Simplot Company, Pocatello, Idaho, covering nearly 5,000 acres of phosphate bearing land near Soda Springs, Idaho.

Plans call for the construction of a phosphorus plant, office, laboratories, and other necessary facilities for the mining and processing of the phosphate rock for use in fertilizers and chemicals. It is expected that the cost will be several million dollars.

The Nickle Lake area near Fort Frances, Ontario, Canada is being surveyed as a possible source of sulphur. Six holes are already down to 1,000 feet in the search.

Safety Winners Cited By Gypsum Association In 1950 Contests

Accidents in the operating plants of the gypsum industry have been reduced approximately 50 percent in the last eight years, according to Lloyd H. Yeager, general manager of the Gypsum Association, who attributes the record to an intensive, industry-wide safety program.

Yeager recalled the reduction in accidents as he announced winners in safety contests conducted in 50 gypsum-producing plants during 1950. The Certain-teed Products Corp. plant of Fort Dodge, Iowa, won the award in Class A, which comprised plants where more than 400,000 man-hours are worked in a 12-month period.

Class B honors went to National Gypsum's plant at Medicine Lodge, Kan., champion of plants, where between 200,000 and 400,000 man-hours are worked annually.

The Class D winner was the Ideal Cement Co. works at Portland, Colo. The latter class included plants which work less than 100,000 man-hours over 12 months. There was no Class C competition.

There was no lost-time accidents during 1950 at the Fort Dodge, Medicine Lodge, and Portland plants. United States Gypsum had an accident-free record in its Class A plant at Norfolk, Va., but won second honors because fewer man-hours were worked. The same company also had accident-free records at its Class D plants in Milwaukee and Cleveland, but again man-hours worked was the deciding factor in the contest awards.

During 1950, Mr. Yeager said, the gypsum industry plants concerned worked 25,125,865.75 man-hours. The total number of accidents were 332. The accident frequency rate was 13.21 accidents per 1,000,000 man-hours worked. The national average for all industry last year was about 15.

The gypsum industry's safety program embraces plant meetings on safety, visual aids, a safety bulletin which is published six times a year, and slide films. The industry has produced one film entitled, *Rx, Prescription for Safety*, which takes up safety in the board plant, and two other films, *Handle with Care* and *Safety in the Plaster Mill*, are already under way.

Members of the industry's 1950 safety committee were M. C. M. Pollard, National Gypsum Co., chairman; George Ware, Celotex; O. F. Grieve, Certain-teed; Webb Caulfield, Kaiser Gypsum; Don Powell, U. S. Gypsum; A. M. Turner, Pabco Products, Inc.; and James Bale, the Grand Rapids Plaster Company.

The cement industry of Schleswig-Holstein, in northern Germany, exported a record 35 percent of its production last year, a spokesman of the State Ministry of Economics and Transportation stated recently. Production last year reached 662,000 tons.

Huber & Davis Plant Licks Loading Problem With Shovel Loader

The firm of Huber and Davis operates a very interesting sand-and-gravel plant a few miles southeast of Salt Lake City at the mouth of Big Cottonwood Canyon. The deposit is a mountain of gravel which is so compacted that it must often be blasted but which contains very little gravel over 6 in. in size.

Loading has always been a problem, and several types of equipment were used without much success until early in 1950, when an Eimco No. 104 Rockershovel was installed. This replaced a tractor-mounted dragline with a ½-cu. yd. bucket and a front-end loader with a 1-cu. yd. bucket. The Rockershovel has a 2-cu. yd. sand-and-gravel bucket and is mounted on a D4 Caterpillar tractor with a special narrow gauge and long track. This loader operates on the same rocker-arm principle as the well-known Eimco underground loader, with the load being thrown overhead to discharge. The entire loading cycle takes only 10 to 15 seconds.

The Rockershovel digs and carries the material to the plant hopper when the distance is under 90 ft. For longer hauls it loads into a Koehring 6-cu. yd. diesel Dumptor, which it loads in less than 1 minute.

The average output of the Rockershovel during the summer months has been 158 cu. yd. per hr., based on a 10-hr. per day, 30-day per month operating schedule. This has been done with a consumption if 15 gal. of diesel fuel daily.

Barton Mines Corporation Orders New Equipment

One of the largest producer of abrasive garnet in the United States — Barton Mines of North Creek, N. Y. — has ordered an SDH-6 diesel engine with a 580-kw Electric Machinery generator and auxiliary equipment from Worthington Pump and Machinery Corporation, Harrison, N. J.

Two years ago an older Worthington type BB diesel engine was moved from the old site to a modern and handsome plant already housing a new Worthington type SDH supercharged diesel.

This order for another 865-hp. 12 x 14, 600 r.p.m. unit will make the second supercharged diesel engine used to increase the present plant generating capacity for mining and processing of garnet. It is expected that the unit will be in operation in the fall.

Concrete Materials and Construction Company, Cedar Rapids, Ia., is operating a 600-ton-per-hour rock crushing plant at Downington, Pa., for the production of aggregates to be used in a part of the New Jersey Turnpike. The plant at Downington is built for movement from one job to another and is set up on a semi-permanent basis. This is the largest of the 14 plants of the company.

Mineral Stock Feed Leads to Expansion

The Livingston Stone Company, Pontiac, Ill., is engaged in a plant expansion program to provide additional equipment for the production of agstone and mineral feed supplement.

The stone at Pontiac is a high-calcium limestone and an excellent material for use in fortifying feed mixtures. Other grades of stone are used in bituminized aggregates and for other industrial purposes.

Among the new equipment being installed are: a washer to remove quarry dirt; a drier to reduce moisture content to ½ percent, storage bins, a Stedman hammermill, and bagging machines.

The growing market for the company's products has led to the expansion program.

New Castle Lime and Stone Company, New Castle, Pa., is opening a quarry in the Hillsville district. Machinery from a quarry at Dunbar is being moved to the new site and the Dunbar quarry abandoned.

The Randall Kilmer Construction Company, Port Angeles, Wash., has started producing pre-mixed asphalt for road work. A Barber-Greene asphalt plant is used to dry and mix the aggregate in the correct proportions.

• Left: Overshot loader powered by a diesel tractor, dozing gravel at the Huber & Davis crushing plant near Salt Lake City.

• Left, below: A view of the firm's operation near the mouth of the Big Cottonwood Canyon. The work involves removing a mountain—of closely-packed gravel.

• Below: A closeup of the shovel loader at work on the tough assignment, digging into the "face" of solid gravel.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

OPERATING information on the various non-metallic minerals industries predominated in the August 1921, issue of Pit and Quarry. There were two articles describing outstanding sand and gravel plant operations, and one each on crushed stone, lime and lime mortar. The gravel plants described were those of the Fuller-Becker Sand & Gravel Co. at Oxford, Mich., and the Clear Lake Sand & Gravel Co. near Clear Lake, Iowa. Both were Link-Belt plants, both used Sauerman dragline cableway excavators, and both were entirely electrically operated, a fact worth mentioning in those days. An unusual feature of the Clear Lake plant was the installation of flood-lights to permit night operation.

Another article described the Linwood, Iowa, quarry of the Linwood Stone & Cement Co. which had been shut down for several years and then improved with new equipment to make it one of the best crushed stone operations in the area. Its rated capacity was 2000 tons per day.

The Ladd Lime & Stone Co., Cartersville, Ga., had just added a new hydrating department to the lime plant built late in 1920. The completed operation was a model in its day, with the latest types of equipment and a completely fireproof building. The foundation, the first and second floors, and the machinery footings were of reinforced concrete, the framework was structural steel, the roofs galvanized iron and the siding was expanded metal plastered with cement stucco. All stairs, galleries, etc., were subway grating and pipe railings were used. The only wood used was in doors and windows. The plant had eight Richard K. Meade 11- by 35-ft. vertical kilns and two Clyde batch hydrators, each with its own Raymond pulverizing system. This company had started operating on this property a few years earlier with one of the most modern crushed stone plants in the South.

The other operating article told of two lime mortar plants built by W. C. Hay of Los Angeles which were believed to be the first successful machine-mixed mortar plants in this country. These were in Oakland and San Francisco, Calif., and were taken over by the Atlas Mortar Co. Later Mr. Hay built a similar plant for the Blue Diamond Plaster Co. of Los Angeles, which was also successful. This had a capacity of 150 cu. yd. of mortar and 100 bbl. of finishing putty a day.

A feature of this issue was the second installment of an article on "Modern Method of Manufacturing Lime" by A. M. Schofield, Atlas Engineering Co., Amherst, Ohio. Also in this issue was a reprint of a paper "Chemical Control the Key to Kiln Efficiency" which had been presented at the recent convention of the National Lime Assn. by W. D. Mount, consulting engineer of Lynchburg, Va. In this paper was described the use of lime in the manufacture of alkali and the methods of lime manufacture employed. These, according to Mr. Mount, were far in advance of the average commercial lime plant from the standpoint of control and resulted in a higher grade lime with a much lower fuel rate.

Other articles included one on business methods by L. T. Sunderland, then president of the Portland Cement Assn., an article on belt conveyors by a staff editor, and a report on the talc industry in California. A news item reported the absorption by the Consumers Co., Chicago, of the Cook County Supply Co., a $5,000,000 concern operating seven crushed stone plants, three sand and gravel plants, a building material supply business and a barge line. An interesting development was the announcement of wage and price cuts in several industries in different parts of the country.

N.L.A. Survey Provides Water Plant Inventory

Inventory of U. S. Water Plants Employing Chemical Treatment is the title of a recently completed survey prepared by the National Lime Association, Washington 5, D. C. The survey is based on information compiled by the U. S. Public Health Service.

The various types of water treatment are listed except where chlorination is the only method employed. Firms engaged in producing lime for water purification should find this survey useful.

Canada Clamps Complete Controls on Sulphur

The Canadian Defense Production Department has ordered complete allocation control over sulphur. The order, which became effective July 2, prohibits anyone from buying or selling sulphur without approval of the Production Department's chemical administrator.

The announcement indicated that the move was taken to channel supplies first into defense production and then, in order of priority, into essential civilian industry. The decision resulted from the growing world shortage of the yellow mineral.

The Redbud Mine, Sycamore Canyon, near Burroughs Valley, Cal., has struck a tungsten deposit on one of its properties. This will be mined and milled in the company's plant which produces aglime, flux, and other high-calcium lime products. The mine is a subsidiary of the San Joaquin Chemical Company.

Two sulphur deposits of excellent quality have been discovered in the salt mine area of Barahona Province and in the Oregano Grande region of the Dominican Republic. Geologists of the Dominican government are working to determine the extent of the deposits.

Sulphur production in the Isthmus of Tehauntepec, Mexico, is expected to begin in October. Six or eight domes have been proved with a potential capacity of about 15,000 tons monthly. The development is being carried out by the Mexican Gulf Sulphur Company assisted by funds from the Import-Export Bank.

Gypsum Production Sets All Time Quarterly Peak

The volume of gypsum mined reached an all-time high during the first quarter of 1951. Mine output was 28 percent higher than the previous peak reached last year. A total of 2,102,006 tons were mined in the first three months of this year.

Gypsum products also showed significant increases with cement retarder rising 33 percent over last year's figure. Gypsum board was up 15 percent, gypsum plaster was up 11 percent, and calcined gypsum up 17 percent according to Bureau of Mines figures.

Commerce Group Appoints Resources Committee

The Chamber of Commerce of the United States has appointed its Natural Resources Committee for the coming year. The committee contains a representation of all the natural resources industries and the related fields. Its functions are to promote cooperation between industry and governmental authorities for the conservation, development and use of the country's natural resources.

The non-metallic minerals field is represented by Horace M. Albright, president, United States Potash Company, New York; Frank E. McCaslin, president, Oregon Portland Cement Company, Portland, Ore.; and William Wallace Mein Jr., vice-president, Calaveras Cement Company, San Francisco, Cal.

The Dominican cement plant, built three years ago has doubled its capacity to 12,000 bags daily to meet the demand from nearby islands and the Dominican republic.

The first mastodon skeleton in western Montana was unearthed recently at the Kallestad Sand and Gravel Company, Deer Lodge, Mont. The skeleton was examined by geolists who considered the find of importance. Ray and Clint Kalestad operate the company.

N.A.L.A.'s Mid-Year Meeting

By L. T. HEARD

NEARLY 90 registrants from 19 states attended the National Agricultural Limestone Association's mid-year convention, held at Chicago's Sheraton Hotel on June 13 and 14. An atmosphere of cooperation and camaraderie marked the meeting as exceptionally successful, this being particularly evident in the actions taken toward the possible merging of the two national agricultural limestone associations.

President Vincent H. Shea (Hoosac Valley Lime Co., Adams, Mass.) opened the first-day gathering with a report on the meeting of the committees on merging the two national associations. He told about his meeting with A. L. I.'s President, Philip E. Heim, from which grew these two 5-men committees. As proof of the progress being made towards a merger, Mr. Shea read three resolutions adopted by the joint committee meeting at Cincinnati.

A motion was made and adopted that a 10-man committee be appointed to discuss the proposed merger with an equal number of A. L. I. members. This same committee was later empowered to explore the possibilities and procedures of forming a new unified organization.

Executive Secretary Robert M. Koch reported on the status and prospects for limestone in the Agricultural Conservation Program. Mr. Koch told of the activities of the association's Washington staff in promoting the farm subsidization for use of agricultural limestone, as well as their efforts to have aglime handled separately from crushed stone under the Office of Price Stabilization. At the time of this report, Mr. Koch was hopeful that a 15-man committee might be appointed—six from each national agricultural limestone association and three from outside—to make suggestions to OPS.

Noting that clear-cut regulations had not yet been established for agricultural limestone, Mr. Koch discussed the price regulations in effect (at that time), and told what changes might be made, and how N. A. L. A. members might be influential in seeing that a workable and fair set of regulations were forthcoming. At the time of this report, Mr. Koch said that an appeal to OPS for relief from regulations was not likely to be beneficial unless an agricultural limestone producer could prove that he was losing money under the present regulations.

In the open discussion that followed, it was brought out by a number of producers that adjustments in price must be developed all the way from the plant to spreading on the field. Some members indicated that they had increased their plant price prior to December 1, but that the truckers hauling their limestone had not increased their price accordingly, and were therefore caught. (Supplementary Regulation 29 to the General Ceiling Price Regulation, released since this convention discussion, allows wholesalers and retailers to pass on this type of increase, plus their normal percentage mark-up.)

Turning to the materials allocation program, Mr. Koch pointed out that the apparent failure of D. O. No. 97 was due to over-application. This procedure for obtaining materials, he said, seems to be important mainly to those producers pressed for considerable materials in a hurry, materials that can't

ABOVE: Some of the ladies attending the convention. Clockwise they are: Mrs. Glenn Hawthorne, State College, Pa.; Mrs. B. V. Everett, Plattsburg, Mo.; Mrs. Russel Hunt, Neosho, Mo.; Miss Merrillyn Green, Carrollton, Mo.; Mrs. R. C. Prall, Milroy, Ind.; Mrs. Joe O'Brien, St. Paul, Minn.; Mrs. Merrill Green, Carrollton, Mo.; and Mrs. Alvin Armbrust, Washington Courthouse, Ohio. BELOW: Three N.A.L.A. officers. From left to right—Treasurer N. G. Farber, (Farber White Limestone Co.), Franklin, N. J.; President Vincent Shea, (Hoosac Valley Lime Co.), Adams, Mass.; and Executive Secretary Bob Koch, Washington, D. C.

From left to right: George B. Nienaber, St. Paul, Minn.; Earl Thomas, Sedalia, Mo.; Joe O'Brien, St. Paul, Kans.; Bob Patton, Columbus, Ohio; and Perry Pederson, Harmony, Minn.

From left to right: L. S. Hackney, Davis Junction, Ill.; Bob Ackland, Rochelle, Ill.; K. C. Ruedebusch, Mayville, Wis.; and T. W. Shaw, Morris, Ill.

be purchased without such an order. In the open discussion that followed, several members objected to the lengthy form and personal questions asked on the Defense Minerals Administration Form MF-100. All of these questions, it developed, do not have to be answered. Only items 1, 2, (except for details of items "a", "b", "c", and "d"), 3 (location only), 4, 5, 10, and 11 need be answered, items 13 through 18 may be omitted or answered by the word "adequate" unless the applicant considers it necessary to answer any of them in more detail, and the certification should be completed.

Following a report on new members—eight new active members have joined the association since the January convention in Washington—and a brief group discussion of the history and democratic workings of the N. A. L. A., Mr. Koch introduced Sam Omasta, who joined the association as assistant executive secretary on May 7.

Reporting on the status of percentage depletion, Director and Regional Vice-President Cale P. Haun (Franklin Limestone Co., Nashville, Tenn.) noted that a bill has been reported out of the House's Finance Committee allowing 5 percent depletion for crushed stone and 15 percent for chemical and metallurgical limestone. (This bill has since passed the House). Mr. Haun, who is also chairman of a N. A. L. A. committee on percentage depletion, indicated that he and his committee would work to include agricultural limestone in this later 15 percent.

The cocktail reception and dinner were held on the first evening of the convention. After the dinner, Executive Secretary Koch spoke briefly about the Washington scene as it affects the agricultural limestone producer. He praised the benefits that producers have received from the conservation program, and told how the Washington office and the annual convention held in Washington have helped to acquaint Congress with the producers' problems. Mr. Koch also referred to limestone tests being conducted by agronomists using radio-active isotopes to determine whether calcium or the carbonate radical or both are important in determining the conditioning of soil for better plant growth. Although the results of these tests are still inconclusive, Mr. Koch suggested that they might lead to less emphasis upon the pH factor as an indicator of soil fitness, and the substitution of a test that included measuring the amount of calcium and magnesium.

The second-day session of the convention on Thursday morning moved at a somewhat slower pace as the members, sparked by Executive Secretary Kock, tied up the loose ends of the many problems, plans, and discussions tackled on the previous day. Following a discussion about the use of various promotional pieces such as a calendar blotter, a monthly aglime newsletter, and various circulation pieces, members turned to an open forum on the relative merits of the purchase plan versus the contract plan for ordering agricultural limestone. Members from states using the contract plan noted that it tends to center business with a few aglime plants, while the main complaint against the purchase plan seems to be that farmers knew too little about it. Considerable time was spent discussing the various problems of the individual producers with both local and national government, and from this a general conclusion was reached that the individual could do much to help himself by becoming familiar with the legal orders pertaining to him.

Mr. Koch concluded the convention with a report on the efforts made to prevent reduction of the $225,000,000 House conservation appropriation to $150,000,000.

Left to right: Lynn Stewart, Columbus, Ind.; Paul Frank, North Vernon, Ind.; R. M. Seifried, Findlay, Ohio; and Earl Heckathorn, Delphi, Ind.

Left to right: Merril Waelti, Juda, Wis.; Perry Pederson, Harmony, Minn.; Charles S. Bryan, Northfield, Minn.; and H. M. Barrett, Granville, N. Y.

Reopen Dimension Stone Quarry To Relieve Shortage of Agstone

another ON THE SPOT report

TO relieve an acute shortage of agricultural limestone in the north-central portion of Indiana, Stuntz-Yeoman Co., Inc., began about 18 months ago to exploit a new source of stone near Kokomo. The new plant supplements the output of another successful quarry operation which the company has carried on for the last six years at Delphi, Ind., which is about 36 miles west of Kokomo. Of the approximately 100 t.p.h. of material produced at Kokomo, about half is at present marketed as agricultural limestone, and the remainder as road stone.

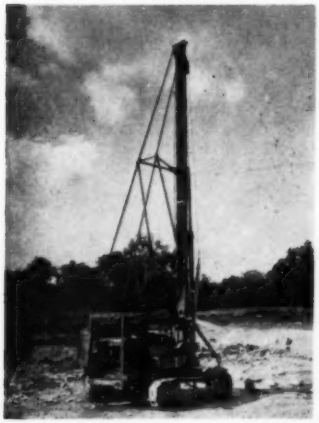
By WILLIAM M. AVERY

• A general view of the Stuntz-Yeoman plant at Kokomo, Ind. The low building at the right houses the secondary crushers; the taller structure shelters the vibrating screens and the hammermills.

Almost all of the 80-acre property owned by the company contains high-grade limestone suitable for the production of both agricultural limestone and concrete aggregrates. The top 4 ft. of overburden, which consists of clay and loam, is stripped with a Caterpillar 6-cu. yd. scraper pulled by a D-6 tractor. Below the overburden there is a strata of gravel ranging from 4 to 5 ft. in depth which is recovered by shovel and run through the plant to produce minus 1¼-in. crushed gravel for road construction.

Some 45 years ago the quarry proper was operated for a time as a source of dimension stone. Utilizing this early development work wherever it was possible to do so, the new owners have opened up a face ranging from 22 to 24 ft. in height. Six-in. diameter blast holes are drilled with a Bucyrus-Erie 22-T churn drill, and about 20 holes, spaced 14 ft. apart and with a burden of 10 ft., are put down for each blast. Delay caps, either Atlas or du Pont, are used with 40-percent dynamite in all primary blasts. The practice is to leave about 10 ft. of shot-up rock against the face as additional burden for blasting. This is said to result in better breakage, and to confine the stone to a relatively small area adjacent to the face. Very little secondary shooting is required. The stone is loaded at the face with a 1½-cu. yd. Northwest diesel-powered shovel, and hauled to the primary crusher with two International K-11 dump trucks.

• Six-in. diameter blast holes are put down with this churn drill.



The trucks dump into a hopper mounted over a 36-in. by 12-ft. Cedarapids reciprocating feeder which discharges the stone into a 16- by 36-in. Pioneer jaw crusher. The crushed material is then elevated on a 24-in. by 130-ft. inclined belt conveyor to the top of the screening plant. Here the material first passes over a 3- by 6-ft. double-deck Cedarapids scalping screen, from which the oversize, consisting of plus 2½-in. material, is conveyed to a Type R-530 Allis-Chalmers gyratory crusher. The discharges of this unit, and of a roll crusher which will be identified later, drop onto a return belt conveyor which closes the crushing and screening circuit at the No. 1 belt conveyor.

Rejects from the lower deck of the scalping screen (i.e. plus 1½-in. minus 2½-in. stone) may be recrushed in the gyratory crusher or trucked to stockpiles located back of the plant. By stockpiling this excess material the plant is assured of a supply of raw stone when the quarry is not in operation. Due to its size, moreover, the stockpiled material is always reasonably dry, with the result that plant operations are somewhat independent of weather conditions. It is planned to accumulate enough of this material to carry on normal plant operations for two or three of the severe winter months without quarrying. The stockpiling is all done during the regular work shift.

The flow of minus 1½-in. stone from the scalping screen is divided between two 3- by 10-ft. double-deck Cedarapids screens on which all the final sizing is done. Oversize stone from these screens drops into a storage bin, and is re-fed by means of a belt conveyor to the 40- by 22-in. double-roll Pioneer crusher referred to above. There are also two bins for the storage of sized, clean stone from which fines have been removed, as well as two bins (one for each screen) for receiving fines which are marketed as agricultural limestone.

Normally the required tonnage

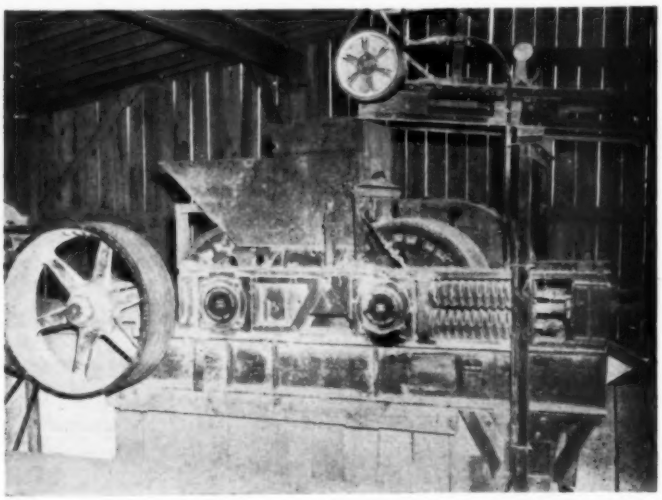
of agricultural limestone can be produced by closing down the 40- by 22-in. double-roll crusher. This effects about the desired 50-50 split between fines and other products. However, the plant is set up to reduce all material to aglime when this is desirable. When this is done, minus 1-in. stone is drawn from one of the storage bins into a bucket elevator which discharges into a small surge bin. The latter feeds two 12-in. New Holland hammermills each of which is capable of producing 12 to 15 tons of agstone per hour. The surge bin is so arranged that it can overflow back into the main supply bin, thus assuring a constant supply of raw stone over the hammermills. The product of the hammermills drops into a 100-ton storage bin from which the material is loaded into spreader trucks or into dump trucks for stockpiling.

In order to increase production and to eliminate certain undesirable features in the present setup, the company is now in the midst of a major construction program. One current difficulty is that when the product is reduced to a size suitable for farm use, it fluffs up considerably, with the result that bin capacity on a tonnage basis is sharply reduced. Although the practice of open stockpiling got around this difficulty, it resulted in other troubles that were almost as serious.

To hurdle this entirely, the company has started construction work on an enclosed 70- by 100-ft. storage shed, which is expected to hold close to 3,000 tons of agricultural limestone. This building will be open on two sides to facilitate removal of the product. Fines from the vibrating screens and the hammermills will be collected on a single belt conveyor which will enter the shed at a height of about 24 ft. above the ground. A tripper operating on the belt conveyor will distribute the material throughout the length of the storage

(*Continued on page 64*)

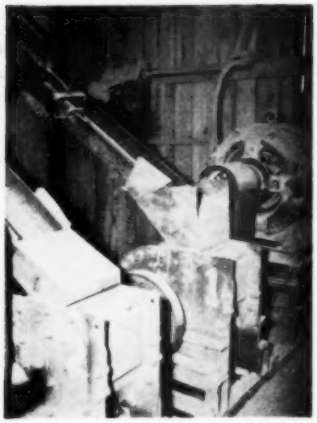
• Above: Secondary crushing is done with this Type R-530 gyratory.



• Above: A view of the 40- by 22-in. double-roll crusher.

• Below: Final sizing of the various products is done on these 3- by 10-ft. double-deck vibrating screens.

• Below: When it is desired to reduce all material to agstone, minus 1-in. stone is fed to these 12-in. hammermills.



California Talc and Clay Concern Uses Foolproof Automatic Controls

By HARRY F. UTLEY

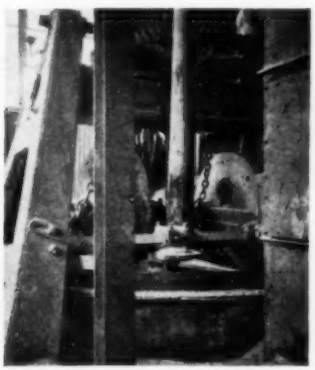
another ON THE SPOT report

THE Sierra Talc & Clay Company is one of the country's important producers and processors of talcs and adsorbent clays. Three plants, one at Keeler, Calif., and two in Los Angeles process the raw materials which are mined at several deposits owned by the company in California, Nevada and Montana. The Keeler plant and the Bay St. plant in Los Angeles are devoted to talc production, while Randolph St. plant (Los Angeles) processes the clays, although some talc is also milled there.

The Randolph St. plant is Sierra's newest operation, having been acquired in 1946 from the old Muroc Clay Co. It has since been modernized and enlarged and serves also as the company's general headquarters.

The raw clay processed at the Randolph St. plant is mined at a deposit on the south shore of Owens Lake, near Olancha, Calif., not far from famous Death Valley. The clay is believed to have been laid down as a volcanic ash which settled over the waters of an ancient lake. Over the span of millions of years the ash has been altered to montmorillonite and other clay minerals to form an activable fuller's earth. This raw material is mined underground by the room-and-pillar method, but the property is being stripped and later on the vast deposit will probably be worked as an open pit.

The clay is trucked 9 miles to a loading ramp at Alancha and shipped the remaining 220 miles to Los Angeles in gondola cars over the Southern Pacific R. R.



• The Randolph Street plant of the Sierra Talc & Clay Company in Los Angeles.

Arriving at the Randolph St. plant, the cars dump into track storage bins. Pan feeders in the bin bottoms put the material on a belt conveyor leading to an Eagle Iron Works dry pan. After grinding the clay is elevated to a feed bin just ahead of a pugmill, a weighing feeder regulating the flow to the pugging blades.

The clay is naturally active to a degree but, when greater adsorptive capacity is desired for the end product, a wet chemical activating agent is added during the pugging cycle. By this treatment, the pH is reduced from a neutral 7 to a pH ranging from 6.5 down to 3.8. Determination of the acidity (or alkalinity) is measured electrically by a Beckman pH meter.

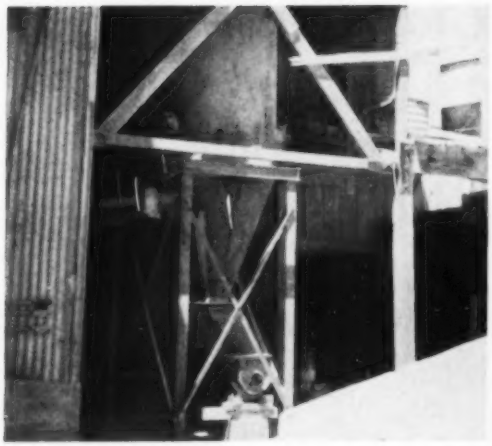
Since the clay as received at the plant often has a moisture content as high as 40 percent (increased still further during the pugging process) while a finished product with a moisture content within an 8 to 12 percent range is desired, the material is next subject to drying. This is accomplished in a 65-ft. rotary dryer of the direct-fired-co-current type. Natural gas is used, with oil-firing standby equipment. Drying temperature usually ranges between 180 and 220 deg. F.

• Left: The raw clay is first sized in this dry pan before drying and milling.

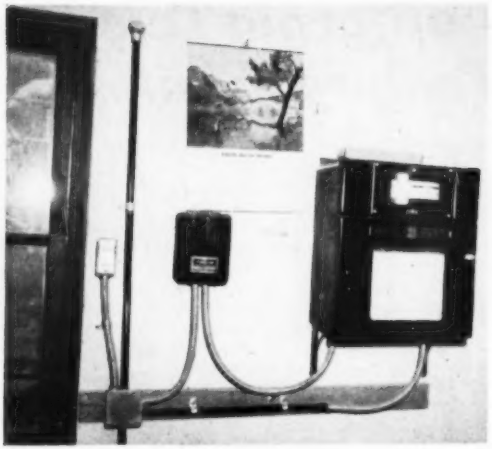
• Right: Looking along the 65-ft. rotary dryer toward the mill building and storage bins.

Uniform moisture content of the dried material is extremely important. Particle-size distribution, too, is greatly affected by extreme variations in the amount of moisture present, and attempts to control this manually by use of an existing millivolt-type strip-chart recorder proved to be a trying procedure. The management then turned to modern automatic instrumentation to solve the problem, and with complete success.

Under the new system, temperatures are sensed at the kiln discharge stack with an Iron-Constantan bare-type thermocouple and are measured, recorded, and controlled by a Wheelco Model 7001 Capacilog.



• End view of the 4-compartment dust collector. The screw conveyor at the bottom removes the recovered dust.



• Mounted on the wall in the office, this strip-chart recorder and automatic controller record and govern temperatures in the rotary kiln.

This is a direct-deflection type strip-chart recorder with a scale and a chart range of 0-800 deg. F. To achieve the ultimate in straight-line control, an Xactline was incorporated in the control system to eliminate the thermal lags, residual heat, and mechanical lags inherent in this type of heat-control installation. The Capacilog recorder combines the Wheelco "Electronic Link" with a motor-driven pen for fast and precise recording. Balancing and frequent maintenance have been unnecessary. The present control system has overcome all the earlier difficulties; and the kiln now requires little attention, permitting both labor and fuel economy.

The dried product is ground and classified by a Raymond high-side 5-roller mill with integral whizzer separator and is packed in 50-lb. paper valve bags by a St. Regis 2-spout packer. Dust generated during processing is handled by a Dracco 4-compartment collector, the reclaimed dust being marketed as a special by-product. Filled bags are palleted, handled, and loaded into cars by Towmotor fork-lift trucks.

"Adsorbol" is the company's trade-name for the activated finished product. It is marketed throughout the world, principally as a decolorizing adsorbent in the refining of edible and other oils—animal, vegetable, and mineral in origin.

Mrs. Dorothy F. Dodds is president of the Sierra Talc & Clay Co. Henry Mulryan is executive vice-president and general manager. Claude Douthitt is superintendent of the Randolph St. plant. Richard S. Lamar is technical director.

Reopen Quarry

(*From page 62*)

area. A Haiss bucket loader will be used for reclaiming material from the storage shed.

It is also proposed to install a larger jaw crusher in place of the present unit. A new 20- by 33-in. Cedarapids hammermill will be used to break down slabs ahead of the gyratory crusher, and to produce additional agricultural limestone when needed. A new 3- by 8-ft. double-deck Allis-Chalmers Ripl Flo screen will be installed in closed circuit with this hammermill. Oversize (plus 2½-in.) stone from the top deck of the screen will go directly to the new hammermill, while rejects from the lower deck (minus 2½-in. plus 1½-in.) will go to a new 24-ft. diameter by 40-ft. high steel silo. The latter material will be conveyed from the silo back to the gyratory crusher, or trucked to stockpiles.

Stuntz-Yeoman Co. was incorporated in 1939 to engage in the contracting business. The crushed stone plant at Delphi, Ind., which has about double the capacity of the Kokomo plant, was started in the fall of 1944, and since that time most of the company's contracting activities have been dropped. Officers of the firm are E. F. Stuntz, president; J. C. Stuntz, vice-president, D. A. Yeoman, secretary; and E. L. Heckathorn, treasurer. Most of the selling for the organization is done by Mr. Heckathorn, who is also currently president of the Indiana Mineral Aggregate Association.

Arizona's Only Cement Plant Doubling 2,000-Bbl. Capacity

Doubled capacity before the end of 1951 is the aim of Arizona's only cement factory, the Arizona Portland Cement Company at Rillito Siding, northwest of Tuscon.

The company, a subsidary of California Portland Cement, has been granted rapid write-off privileges for tax purposes on its expansion investment, estimated at $2,945,758. Purpose of the expansion is to keep up with the growing demand for cement in Arizona, which arises partly from defense construction.

Optical Mineralogy Book in New Edition

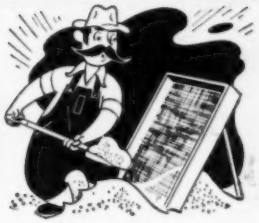
The fourth edition of *Elements of Optical Mineralogy, Part II—Description of Minerals*, by Alexander N. Winchell in collaboration with Horace Winchell is now available from the publisher, John Wiley & Son, Inc., 440 Fourth avenue, New York 16, N. Y. at $12.50 a copy.

This edition gives a description of minerals that can be recognized by a microscope. They are classified by chemical composition and crystal structure. A wealth of illustrations aids in using the book. Diagrams show variations in chemical compositions and the corresponding variations in optical properties.

Dr. Alexander Winchell is professor emeritus of geology, University of Wisconsin, where he headed the department and taught since 1908. He was resident consultant with the American Cyanamid Company, and is the author of other works on petrography.

Dr. Horace Winchell is an assistant professor of mineralogy, Yale University. He has industrial experience as a water supply geologist and a research crystallographer.

Screenings



by William M. Avery

JUST back from a five-week whirl through the great Southwest, we have an uneasy feeling that this department ought to be in shape to let loose a profound observation or two for the amazement of its readers. But after careful reflection we have decided to handle this fleeting impulse in the same way we treat our occasional urge to indulge in violent exercise: namely, by ignoring it completely.

Just to show, however, that we recognize and appreciate profundity when we run into it, we herewith reprint a poem entitled "The Quarry" which appeared in a recent issue of the New York *Times*. This is so profound that we haven't the foggiest notion what the hell it's all about.

I have come down to content
In small things: not the tree
But the way the twig is bent
Not sky, but slope of blue
Not all, but the felicity
Of quiet times speaks true
I have come to know at last
The strength of warmth, not fire
And in the bright cloud going past
See surer reach than star
In the country round inquire
Rather than the far
Past din of drills and fit *(sic)*
Of cranes I came into the quarry
Down rockside stars *(sic)* steep
flight
The cool coercion of the pit
Turned me to the light

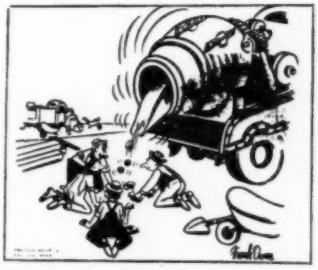
While we are busy locating the authoress to offer her the much-sought-after post of poet laureate to the pit-and-quarry industries, we hope that any of our readers who have experienced "the cool coercion of the pit" will communicate with us at once. We feel the phrase would make a fine, upstanding motto for our masthead, but we'd like just a little clarification before reaching a definite decision.

No Sale!

STONES, bricks, old nails and other debris discarded in the process of renovating the White House are being offered to the public in souvenir kits ranging in price from two bits for a piece of lath to $100 for enough stone or brick to face a fireplace. We presume that this project was conceived by the Democrats out of a charitable desire to offer the next generation of Republicans some contact, however slight, with the Executive Mansion. Anyway, it's no go so far as we're concerned. If we can't move into the place bag and baggage, we don't want any old hunks of debris cluttering up our premises to remind us of the Democratic monopoly.

You're Faded!

MR. L. V. PLUGRADT, office manager of the Klinker Sand & Gravel Co., Seattle, Wash., has written us to point out a variation on the use of transit concrete mixers which we had somehow overlooked. His company has loaned truck mixers out to local organizations on several occasions for the mixing of



ticket stubs. In one drawing, he reports, there were 800,000 ticket stubs in the barrel of the mixer. We presume, however, that the drawing was orthodox in other respects; *i.e.*, that only 799,999 ticket holders were dissatisfied with the outcome.

A related possibility is suggested in the accompanying cartoon, which is reprinted here by permission of the editors of *The Saturday Evening Post*. Both notions, we believe, stem directly from man's inherent lack of faith in man, which in turn has given birth to the widespread belief that machines are honest, impartial, and incorruptible. Just off hand we've no idea how one would go about corrupting a concrete mixer, but we'll lay odds it can be done.

Bam! Boo!

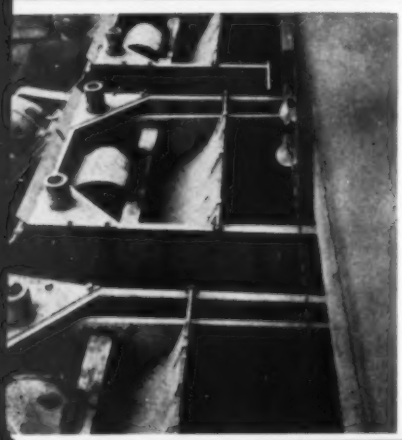
IN a recent news letter the Commerce Department's office of Technical Services reports on the substitution of bamboo for steel in reinforced concrete. There is no indication at the moment as to whether this fascinatin' new material will be called "bamcrete" or "boocrete". If our readers have any opinion in regard to this vital matter, we herewith urge that they keep it to themselves.

Cause for Complaint

WE understand that the Egyptian Government has called in an assortment of experts to perform plastic surgery on the Sphinx. The old girl is said to be suffering from infirmities of age, and stone and cement are crumbling from her face and forelegs.

Our source of information states that this is by no means the first time the Sphinx has needed repairs. It seems that King Thutmoses IV

had some work done over 3,000 years ago, and King Ramses II of the 19th Dynasty ordered some patching a mere 2,900 years ago. Too bad they can't locate the bunglers who did that last job and make 'em do it over right.



Aggregates For

By HARRY F. UTLEY

From top to bottom:

Covered 36-in. by 3,700-ft. belt conveyor system runs from the reclaiming tunnel to the batching plant, barely visible in the distance.

View showing batching plant and cold-air piping from adjoining refrigeration building. The cement silos are at right; the aggregate conveyor, at left.

Looking down on the pair of double-rake classifiers in the sand plant.

Three rod-deck screens make the plus and minus ¾-in. separation at the pit plant. The screens operate dry.

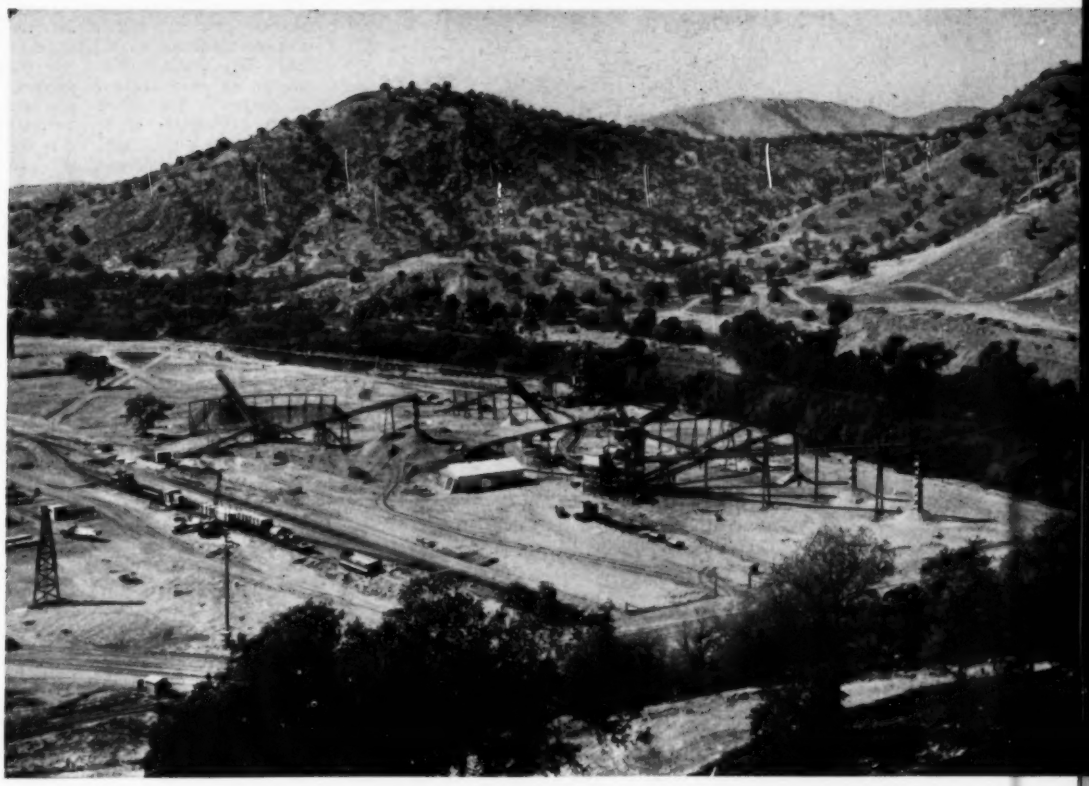
On opposite page:

View, taken shortly after operations began, showing the layout of the finished sand-and-gravel plant. Cars from pit unload at hopper at extreme left.

another ON THE SPOT report

CONSTRUCTION is well under way this year on Pine Flat Dam on the Kings River in California, 30 miles east of Fresno. A mighty project of the U. S. Corps of Engineers, Pine Flat will, a few years hence, take its place among other eminent mass-concrete structures built by man to subdue and put to work the erratic flow of important rivers.

Uncontrolled flood waters of the Kings have always been a tremendous obstacle to full agricultural and industrial development of the central California area served by this particularly unruly mountain stream. Heavy seasonal run-offs rush down from the Sierra Nevadas into the shallow channel of the Kings, spilling over into the network of irrigation canals on the valley floor. Since 1936 flood damage from the Kings is estimated to have caused between $15,000,000 and $20,000,000 in property losses alone. The river's most recent dramatic and entirely unseasonal display occurred only last November.



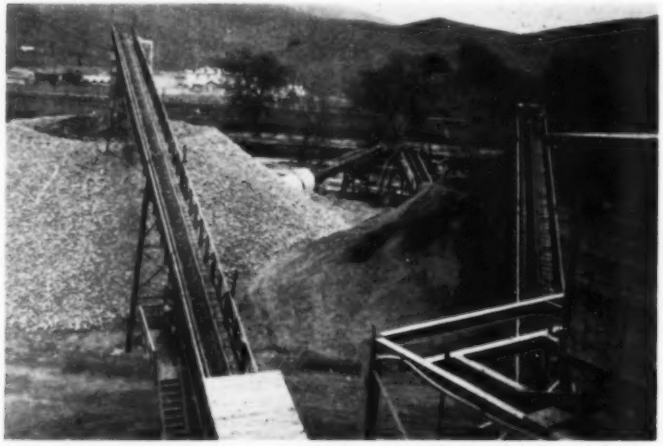
The main construction contract for the dam was awarded to Pine Flat Contractors, a joint-venture group composed of Guy F. Atkinson Company, the sponsor; Bressi & Bevanda Constructors, Inc.; Charles L. Harney, Inc.; J. A. Jones Construction Company; and A. Teichert & Son. The contract price was $24,339,776.

The volume of mass concrete needed will be 2,150,000 cu. yd., requiring 1,600,000 bbl. of cement furnished by Calaveras Cement Company; and approximately 4,000,000 tons of aggregates, produced on the job by the contractor. Full-scale aggregate production got under way in the autumn of 1950.

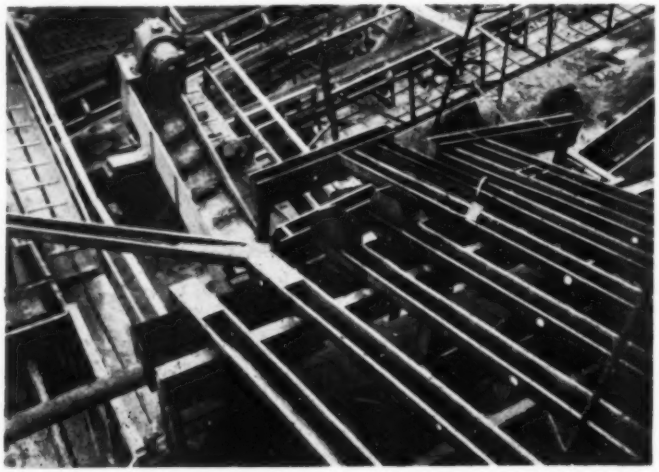
Turning out the aggregate is both interesting and unusual in several respects. In the first place, the sand is completely and entirely a natural product, in contrast to most other Western dam projects of recent date where some, if not all, the fines were manufactured by grinding in ball- or rod-mills. Coarse aggregate, too, is 100 percent natural gravel, produced wholly without benefit of crushing oversize. These decisions were solely those of the contractor and were not mandatory in the specifications. Basic economies and the nature and geography of the deposit dictated the choice of method. The pit is 6 miles downstream from the finished screening-and-washing plant, and the haul is by rail over trackage laid by the contractor. Primary separation and balance is achieved at the pit, with waste sizes eliminated at the source; so the rail-transported material is all pre-sized, usable gravel and sand requiring merely final processing.

The deposit embraces about 200 acres of Kings River sand and gravel, and the principal excavating machine, a Bucyrus-Erie 120B crawler-mounted electric dragline pulling a 5-cu. yd. Esco bucket, loads directly into side-dump railway cars. The pit track forms a complete circuit, three G.E. 44-ton diesel-electric locomotives drawing the loaded cars, two to a train, to the primary-plant's 2-compartment hopper located at a central point on the deposit. The hopper is 13½ ft. deep and each compartment is fitted with a Conveyco reciprocating plate feeder. These, in turn, feed to still a third Conveyco feeder to put a capacity, uniform load on the 48-in. by 296-ft. belt-conveyor which runs up to the top of the plant. The first pass is over a pair of Ty-Rock F600 5- by 12-ft. double-deck screens, top decks rejecting the plus 6-in. boulders which are chuted to a car-loading waste bin. Lower decks take out 6- to 3-in. material which bypasses the remaining screens in the pit circuits to reach the coarse-material storage pile. Bottom-deck throughs (minus 3-in) are passed to three Symons 4- by 8-ft. rod-deck screens to remove the minus ¾-in. material which is carried by a 30-in. by 152-ft. conveyor to stock pile. Oversize from the rod-deck screens (3- to ¾-in.) may go to a Ty-Rock 5- by 12-ft. double-deck screen for removal of the minus 1½ plus ¾-in. for stockpiling; or the rejects may optionally be sent directly, either in whole or in part, to the coarse material pile.

Above: Drainage and blended sand stockpiles at the finish plant. Below: Stockpiling coarse and fine material at the primary plant in the pit. Tunnel-recovery conveyors to the car-loading hopper are just beyond the piles.



Below: The interesting arrangement of eight flumes from the 8-pocket sizers, indicating flexibility for combining fine sand fractions. One of the screw dewaterers is seen at the ground level.



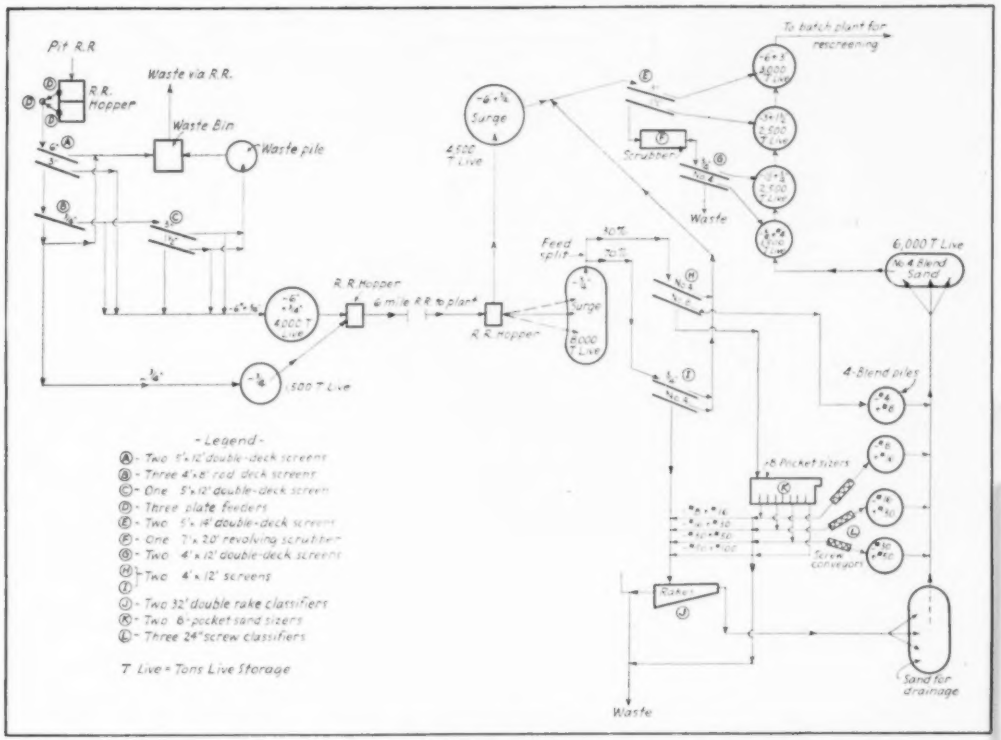
So flexible is the screening circuit, however, that any size of material may be sent to the waste pile, screen feed being determined by the amount of waste necessary to keep the output in balance with the mix design. Controls in the primary plant at the pit, as well as at the finish plant, are centralized and fully interlocked.

Two 30-in. belt stacker conveyors, one 197 ft. and the other 152 ft. on centers, build up the two surge-storage piles of material from which separate tunnel conveyors withdraw the selected aggregates for transportation over the 6-mi. rail line to the washing and separating plant near the base of the dam. The coarse-material pile (6- to ¾-in.) has 4,000 tons' live storage capacity; the fine-material pile (minus ¾-in) 1,500 tons. Recovery belts run to a car-loading hopper, where a 50-ton car can be loaded in about a minute. About 16 side-dump cars are presently in use between pit and finish plants, all owned by the contractor. They are drawn by Baldwin and American 100-ton diesel-electric locomotives.

Upon arrival at the final processing plant, the cars dump to a receiving hopper, where a flop gate diverts the material to 36-in. wide belt conveyors to build up two surge piles which separately serve the sand and the gravel plant circuits. The coarse pile for the gravel plant, and the fine pile for the sand plant contain the same material as stored at the pit, the split being at ¾ in. Tunnel-reclaiming conveyors from each pile feed the two processing operations.

Five Conveyco belt-feeders load the 24-in. by 470-ft. conveyor line running up to the sand plant, where the material coming off the belt is split, approximately 70 percent of it going to a spray-equipped Allis-Chalmers 4- by 12-ft. Low-Head double-deck screen. At this point the ¾-in. No. 4 material is taken out and conveyed to the gravel plant. The minus No. 4 throughs are flumed to a pair of Dorr 32-ft. double-rake classifiers having a capacity of 250 t.p.h. of finished sand. Fresh water is added at the rakes.

The remaining 30 percent of incoming material split off at the top of the sand plant goes to another 4- by 12-ft. Low-Head wet screen, where, after the ¾-in. to No. 4 portion is likewise sent over to the gravel plant, the No. 4 to No. 8 material retained on the lower deck is carried to separate storage for use in blending. Much of the screen output consists of minus No. 8 sand which is flumed to two Dorr 8-pocket sizers



Flow sheet and accompanying legend showing aggregate movement from pit to stockpiling.

for minute separation by hindered settling. Spigot discharges may be individual or combined by manipulating the spigot hoses to the desired outlet flume. All minus 100-mesh fines are wasted with the dirty water rising from the pocket sizers, a sufficient quantity of the finest fraction being obtained from the first sand screen. The sizers ordinarily yield four products: minus No. 8 plus No. 16; minus No. 16 plus No. 30; minus No. 30 plus No. 50; and minus No. 50 plus No. 100 sands. The finest of the four go to the rakes previously mentioned, while the remaining three are separately dewatered by three 15-t.p.h. Wemco 24-in. screws. The products are stored separately for blending later. Flexibility of arrangement is again readily apparent in the sand circuit, since any of the fractions may be diverted to the rake classifier or partially or entirely wasted if the balance should be at all upset.

Storage piles of finished sand built up by a radial stacker are reclaimed by tunnel belt conveyors, with the feed under watchful control to blend the supply destined for the batch plant. Specifications call for an average F.M. of 2.44, the maximum being 2.70 and the minimum 2.20. Day-to-day variation may not, however, exceed 0.10. The gradation table in the specifications shows only slight variance from the rigid demands of other recent Army dam jobs in the West. For the record, at Pine Flat it is as follows:

Sieve Numbers	
Passing:	Ret. on:
.....	No. 4
No. 4	No. 8
No. 8	No. 16
No. 16	No. 30
No. 30	No. 50
No. 50	No. 100
No. 100	No. 200
No. 200	pan

Percent by Weight		
Min.	Des.	Max.
0	0	5
5	8	15
10	14	20
20	25	30
20	28	30
12	17	22
3	5	7
1	3	5
	100	

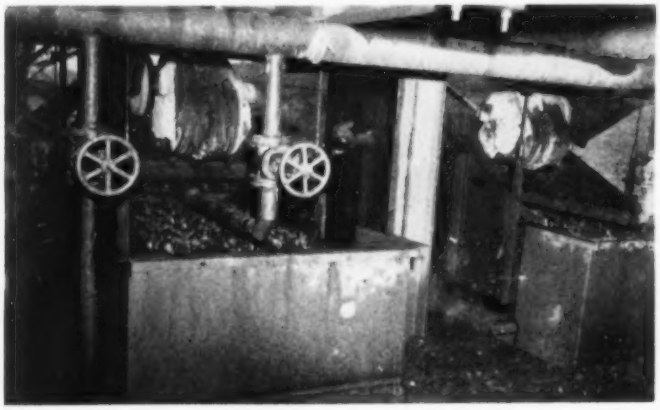
Gravel processing is relatively simple, since the surge pile supplying the screens contains pre-sized material in approximate balance, requiring merely washing and sizing. Four spray-equipped Allis-Chalmers double-deck screens, two 5- by 14-ft. Ripl-Flo units and two 4- by 12-ft. Low-Head units make the separations. Everything under 1½ in. is, however, first scrubbed in a Willamette Iron & Steel Co. 7- by 20-ft. revolving scrubber built of solid alloy-steel plate and lined longitudi-

The sand processing plant, showing pocket sizers and rake classifiers below.

nally with rail lifters. The final pair of washing-and-sizing screens carries No. 4 mesh on the bottom deck, and any throughs are wasted with the used water. Four sizes of finished gravel are produced: minus 6-in. plus 3-in.; minus 3-in. plus 1½-in.; minus 1½-in. plus ¾-in.; and minus ¾-in. plus No. 4 mesh. These are stored in four separate piles by 24-in. stacker belts ranging from 159 to 234 ft. long. The piles are in line over a reclaiming tunnel connecting with the blended sand storage to feed the long conveyor which carries all the finished aggregate to the batching plant high up on the south rim of the site.

Above: Stockpiling conveyors from the finished washing-and-screening plant for gravel.

Above: The diesel-electric dumps a load into the receiving hopper at the pit plant. Below: The pair of 4- by 12-ft. screens which make 1½- to ¾-in. and ¾-in. to No. 4 fine gravel.



Engineering, design, and considerable equipment including improved-type Conveyco grease-sealed rolls and idlers were supplied by the Conveyor Co., Los Angeles. Conveyor belting was furnished by the U. S. Rubber Co. Nearly all the motors are General Electric. Water is obtained through a filtration bed from the river and the 5,100-g.p.m. requirement is lifted by three Layne & Bowler 100-hp. pumps. Dirty water and waste fines are raised from a ground-level sump to an elevated tank by three Wemco sand pumps and then flumed to a settling pond to avoid pollution of the river.

The conveyor system which carries the finished aggregates up to the batching plant is covered overhead for protection from the weather. Belting is 36 in. wide, and six flights are used for a total distance up the hill of 3,700 ft. Belt speed of the first flight is 340 f.p.m. and each succeeding flight is speeded up 10 f.p.m. to avoid possible pile-ups on the incline.

While all finished aggregate is carefully sized and washed at the plant proper, the gravel is nevertheless rescreened and rinsed again after it leaves the long conveyor up at the concrete-mixing operations. A separate tower alongside the batch plant houses two 5- by 16-ft. Ripl-Flo and two 4- by 14-ft. Low-Head 2-deck screens to accomplish this. The sand, however, is not subject to further attention, being already specification blended, and goes directly into its proper bin. Loading of material onto the 3,700-ft.-long conveyor is regulated from the operator's floor at the batch plant, not by direct control but via an intercommunication system to the gate operator in the reclaiming tunnel below.

The four coarse sizes are precooled, as is the cement, before batching and mixing, in conformance to specifications. A cold-air blast system, utilizing ammonia-compressor refrigeration, is in closed circuit with the gravel and refrigerating tanks housed in a separate building alongside the batch plant. The cooling system, designed by the Hightower Heat Engineering Co., forces the frigid air through louvers in the bottoms of the bin compartments just before the gravel is weigh-batched.

Cement is cooled by heat exchange, cold water just above the freezing point circulating through hollow flights of enclosed cement screw conveyors. In the hot summer months, ice will be used almost ex-

(*Continued on page 72*)

Vermiculite Producers Hear Leading Industry Members At Ft. Lauderdale Meeting

MEMBERS from all parts of the United States and Canada attended the annual meeting of Vermiculite Institute held at Fort Lauderdale, Fla., April 7 to 12. Also present was Philip D. Armour, chairman of the board of the Zonolite Company and grandson of the founder of Armour & Co. Stanley K. Robinson of F. Hyde & Co., Montreal, Canada, president of the institute, presided.

Eric W. Hammarstrom, chief, Nonmetallic Building Materials Branch, National Production Administration, guest speaker, expressed certainty that vermiculite as insulation and as lightweight aggregate replacing sand in plaster and concrete will greatly relieve the shortage of critical construction materials. He said that expenditures for the defense program will fall most heavily on metals and chemicals, and that these vital products will become increasingly harder to get as the year progresses.

A new structural vermiculite-sand concrete designed for floor construction in which bar joists or Junior I beams carry the slab was described by C. A. Pratt, chairman of the Institute's Technical Committee, and vice-president of Western Mineral Products Co., Minneapolis. This concrete weighs half as much as ordinary concrete and will save critical steel. Recent tests of full scale models at Jacksonville, Fla., showed that a 3-in. floor slab over 24-in. center joist spacing will carry from 15 to 23 times more live load—depending on the type of reinforcing used—than the 80 lb. per sq. ft. required for many light occupancy buildings.

Other advantages are good insulation value (four times that of sand concrete) and resiliency approaching that of wood floors. Both these properties mean more comfort to occupants. The compressive and indentation strength of the new concrete are adequate for use as a base for tile (ceramic or composition), linoleum, terrazzo, or carpeting, without the addition of a regular sand concrete topping.

A new precast vermiculite concrete roof tile developed by Southern Zonolite Co. of Atlanta, Ga., was described by Robert Sterrett, president of that firm. Its advantages, he said, include speed of installation, fireproofiing, insulation, and a finished exposed ceiling on the under side, all in the one material. The insulating quality of the tile was well shown by recorded temperatures in a drying kiln recently constructed, Mr. Sterrett said. Even with a temperature of 590 deg. inside the kiln, the highest temperature in the tile, recorded by themocouples, was only 190 deg F.

The tile is 18 by 36 by 3 in., and weighs about 10 lb. per sq. ft. The blocks are laid in place on steel subpurlins or steel joists spaced 36 in. on centers. The slabs are butted tightly together and covered with a built-up roof of pitch-and-gravel.

A new exterior stucco that reduces cracking and is easier to apply than straight sand stucco mix was described by Glenn Sucetti, vice-president of the California Zonolite Co., Los Angeles. The unique properties of the new stucco are obtained by adding vermiculite concrete aggregate to the usual sand and cement mix. The vermiculite aggregate gives the stucco mix greater resilience and "slip", Mr. Sucetti said. Other advantages are lower cost to the owner,

• Carlyle Emery, Ruthrauff & Ryan, Inc., one of the featured speakers at Ft. Lauderdale.

• Gerald R. Stark, Texas Vermiculite Co., Austin, Tex., newly-elected president of Vermiculite Institute.

as compared with sand stucco, a more waterproof wall, less dead load on the building, and fireproofing and insulation values.

The light weight and adherence of vermiculite stucco permit it to be put on in greater thicknesses. Mr. Sucetti cited a store front that needed a two-in. stucco application to bring it in line with adjoining structures. This could not have been done with a straight sand-cement mix, but was successfully accomplished with two coats of vermiculite stucco, Mr. Stucetti stated. The new stucco was used on 400 houses recently built by a large California contractor.

Asphalt-bound vermiculite roof insulation, another recent development, was discussed by Stanley K. Robinson. It has been used with good results on a number of buildings. Not long ago a Detroit contractor placed a 4,600-sq. ft. roof of this material in a single day. Moreover, the vermiculite-asphalt mix is lightweight, provides insulation, and allows built-up roofing to be applied the same day the mix is applied. The only special equipment required is a plaster mortar-type mixer.

L. A. Barron, engineer, Vermiculite Institute, discussed vermiculite and building codes. He listed four major regional codes, in all of which vermiculite plaster and fireproofing, vermiculite concrete, and vermiculite acoustical plastic are specifically approved for use.

Dayton Prouty, general manager, Zonolite Company's Dearborn Division, and chairman of the institute's Plaster Subcommittee, reported that in addition to the large number of fire tests which already have been

• John Myers, vice-president, Zonolite Co., Libby, Mont.; Mrs. Robert Sterrett, Atlanta, Ga.; Frank John, president, Zonolite Insulation Co., St. Louis, Mo.

• John H. Bishop, secretary, Zonolite Co., Chicago; W. J. Bein, vice-president, Zonolite Co.; Mrs. Bein; and Past President S. K. Robinson, F. Hyde & Co., Montreal, Canada. The Beins are displaying their 20th wedding anniversary gifts.

conducted to establish vermiculite plaster as the most outstanding medium devised for fireproofing steel construction, more fire tests will shortly be made by the Bureau of Standards on columns and on solid vermiculite plaster partitions. This is being done to keep pace with new developments and with a view of promoting ever lighter and less expensive construction. Mr. Prouty displayed a miniature sample of the type of column protection which will be tested.

Dr. George E. Ziegler, director of Midwest Research Institute of Kansas City, Mo., discussed the use of expanded vermiculite as a unique fertilizer conditioner. He has been conducting an extensive experimental study of the potential use of vermiculite in agriculture. About half of the total fertilizer produced requires a conditioner, Dr. Ziegler stated. It is added primarily to prevent the fertilizer from caking like concrete. Most conditioners are by-products of organic origin; their supply is seasonal, the quality is variable, and they often represent a serious fire risk, according to Dr. Ziegler.

"Vermiculite, however, is fireproof and verminproof," he continued. "It is available in any quantity that may be demanded by fertilizer mixers. Most important of all, it is a consistent product of definite physical and chemical properties."

Carlyle Emery of Chicago, vice-president of Ruthrauff & Ryan, Inc., nationally known advertising agency, was the final speaker on the program. Mr. Emery said that advertising and selling are the only answer to the challenge of the productive capacity of American business, and listed five essential points for an all-star advertising program.

"The product must be competitive in quality and price," he declared. "The copy story must be based on the public's known reading and buying habits. Repetition is essential, for it is human nature to forget. Merchandising is a 'must.' And, finally, good human relations, . . . understanding and co-operating with the other fellow, mean more than a glib tongue."

Gerald R. Stark, president of Texas Vermiculite Co. at Austin, Tex., was elected president of the institute, succeeding Mr. Robinson. J. B. Lyall, vice-president of Vermiculite-Northwest, Inc., Spokane, Wash., was elected to the board of directors Other members of the board are John Myers, vice-president of Zonolite Co., Libby, Mont.; C. A. Pratt; G. R. Stark; and S. K. Robinson.

A gavel carved from a White House timber, removed from the historic building in the current remodeling, was presented to Mr. Robinson in the name of the Institute by Walter Simpson, past president. The meeting was concluded with a banquet at the Lauderdale Beach Hotel.

Pine Flat Dam

(*From page 70*)

clusively in place of water in the mix. Otherwise, sufficient ice is added to the mixing water to keep the temperature low enough so that placing temperature of the concrete is safely below the 50-deg. F. maximum permitted by the specifications. No cooling pipes are being embedded within the concrete mass in the dam.

Type II cement is received by bulk carriers of the Calaveras truck-trailer fleet and is stored in two steel silos having a combined capacity of 15,000 bbl. and located a short distance from the concrete plant. A Fuller-Huron Airslide conveyor 400 ft. long transports the cement from the silos to the batching structure. The batch plant is fully-automatic and was supplied by the Noble Company of Oakland, Calif. It has a bin-storage capacity of 1,500 tons of aggregates. The entire batch plant structure and cooling ducts are well insulated with a covering consisting of two layers of ½-in. glass fibre blanket with an aluminum outer skin to repel reflective heat.

Concrete is mixed by four 4-cu. yd. Smith tilting mixers and placed by cableway with Garbro 2-compartment 8-cu. yd. buckets.

Maximum height of Pine Flat Dam will be 440 ft. Total length will be 1,815 ft., with a 292-ft. spillway section in the center. The reservoir created by the impounded water will cover 6,300 acres with a 67-mi. shoreline. Maximum storage capacity will be 1,110,000 acre-ft., all required for flood control. However, climatic conditions will also permit full utilization of the reservoir for conservation storage at the end of the season. This will allow the reservoir to aid irrigation, possibly develop hydro-electric power, and provide other benefits by stretching a heavy seasonal water supply out over a long, dry summer. It will enable water users to draw their established share when they need it, instead of leaving the time of delivery to the whims of the river.

Earl M. Jennett is project manager for Pine Flat Contractors. Geo. Archibald is project superintendent; R. G. Rofelty is project engineer; Guy Heimsoth is assistant manager; Hugh Parker is plant engineer; and James Brown is plant superintendent.

Construction is under the direction of the Sacramento District, U. S. Corps of Engineers. Col. C. C. Haug is district engineer, and E. H. Gruenwald is acting project engineer.

State Legislatures Act To Curb Truck Overloading

BILLS providing more stringent penalties for violation of truck weight laws have been enacted by the legislatures of at least ten states thus far this year and are pending in eight other states, a survey discloses.

A measure enacted in Indiana authorizes the impounding of overloaded vehicles until the excess weight is removed and all fines have been paid. The new act also authorizes suspension of Indiana operating rights for periods from 5 to 30 days for weight limit violations. Such suspensions may be invoked against all trucks of a company operating a single vehicle found overloaded.

Four bills designed to curb truck overloading were enacted in Iowa. One of the measures provides for imposition of a graduated scale of fines, ranging from $1 to $8 per 100 lb. of load above legal weight limits. It permits fines of $750 to $1,000 or more for heavy overloads, as compared with a former maximum penalty of $100.

Another of the new Iowa acts increases from $83,000 to $250,000 a year the amount the state highway commission may spend for weighing of trucks and truck combinations. A third measure empowers the highway commission to condemn land for the establishment of additional weighing stations, while another new act gives commission officers authority to invade private property in pursuit of trucks suspected of trying to avoid being weighed.

A new Maryland law provides that any state police officer, member of an authorized weighing crew, or "peace officer" having enforcement powers may cause a driver to submit to vehicle measurement or weighing, or both, by either portable or stationary scales.

The Maryland act requires "the trial magistrate upon the conviction for a violation" to impose the following fines: violation of less than 5,000 lb., 2 cents for every pound of excess weight; violation in excess of 5,000 lb., 6 cents for every pound of excess weight. The trial magistrate, under the act, "shall not have the power to suspend or reduce the fine." In the case of an out-of-state violator, the trial magistrate "may impound the . . . vehicle until such time as the fine is paid or acceptable collateral is posted," but the impounding of the vehicle "does not include the cargo."

It is further provided by the new Maryland law that when a weight or length violation is found, the vehicle "must be unloaded" and "all material or cargo so unloaded shall be cared for by the owner or operator." If the load is indivisible, a first offender may be allowed to proceed upon purchasing a special permit at $10, but a second or subsequent offender "must return to the place of entry or origin . . . after obtaining a permit." An overloader of perishables, under the act, "shall be allowed to proceed to destination" on first offense within any one calendar year, but if there is a second or subsequent offense within any one calendar year the products "must be unloaded" before the vehicle can be moved.

Legislation enacted in Nevada authorizes state highway patrol officers to stop for weighing any vehicle they have "reason to believe" may be overloaded. It further requires the driver of such a vehicle to stop at a "suitable place" and remove the overload. The former Nevada law said the unloading had to be accomplished immediately — a requirement which resulted in some rather obvious difficulties in the case of live animals or perishable produce.

The new Nevada act gives the patrol officer authority to permit the driver of an overloaded truck to proceed to his destination with the load, provided the overload does not exceed 5 percent and provided that such permission does not waive the penalties provided in the law. It further makes the driver and/or his employer guilty of a misdemeanor for failing to stop for inspection when ordered, or for violating any other section of the act.

The Nevada legislation also transfers the portable weighing scales of the highway department to the State Public Service Commission and increases the number of the commission's highway patrolmen from 25 to 31 to insure stricter enforcement of trucking laws. It further empowers the highway department to promulgate rules and regulations under which overweight and oversized vehicles—particularly those of general contractors—can be moved over the state's highways.

By BETHUNE JONES

North Carolina's legislature approved tougher penalties for overloading and called for stricter enforcement of weight limits by the State Highway Patrol. Bills increasing penalties for overloaded trucks were signed into law in North Dakota, Oregon, and Utah.

Under a new law enacted in South Dakota, a graduated fine ranging from 3 to 10 cents a pound for excess weight can be charged.

A measure enacted in Texas permits state highway police and sheriffs, as well as weight inspectors, to enforce the law against overloading. Under the new law, trucks carrying excess weight can be required to unload the extra poundage on the spot, except livestock and certain perishables.

Bills providing for suspensions and heavier fines for overloaded trucks were passed by the Illinois Senate and sent to the House. Under the proposed legislation, truck companies which had 10 or more overweight violations in a year could be barred by court from the highways for 90 days. If more violations occurred after the suspension, the firms could be suspended for a year. If a firm operated despite the suspension, the driver could be jailed for 10 to 90 days and be fined up to $500, and the company could be fined $1,000 to $5,000. Fines for overweight trucks, under the bills, would be put on a pound basis. The penalties would start at 2 cents per lb. up to 2,000 lb. over legal limits, and range up to 10 cents per lb. above 5,000 lb.

Under a bill pending in the Maine legislature, registrations of all trucks owned by any persons convicted three times of overloading a truck would be revoked. The bill would bar such persons from registering a truck in Maine for five years.

A Massachusetts bill would pro-

(*Continued on page* 81)

WASHINGTON NEWS LETTER

Post-Korea Economics

SO far, the developments in Korea have had only one effect on American business. They have compounded the confusion.

"What would peace in the Far East mean to American business?" is a question which is not only uppermost in the minds of businessmen, but it is being asked by everyone—workers, farmers and above all, government officials.

The official Administration position is that, regardless of what happens on the international scene, the rearmament program will go forward with undiminished speed. A realistic appraisal of the situation indicates, however, that this position is not likely to prevail.

The Administration, too, is discovering that it is less and less master of its own fate. Not only is it influenced by international events but domestic political forces also effectively prevent its freedom of action.

Congress, of course, exercises its authority principally through its power over appropriations. It has already appropriated over $130 billion dollars for defense. By the end of June, 1950, only $21 billion dollars had been spent. This leaves about $109 billion still to be spent. In addition, it now looks as though the present Congress will appropriate something in the neighborhood of an additional $60 billion, making a total of $169 billion dollars available for defense spending.

If the Administration would, in fact, be permitted to spend all of this money, it could live up to its expectations for an expanding rearmament program. It is unlikely that it will be able to spend this sum because of:

1. the temper of Congress
2. the psychology of citizens in a period when no active war is in progress, and
3. the unwillingness of business men to forego their regular business in favor of war orders.

Below is a comparison between what the Administration would like to spend (scheduled expenditure) and the best estimate that can be secured at this time as to what they are going to be able to spend (likely expenditure).

Even the reduced amounts are still sizable when compared with the level of expenditures in the recent past. Should peace or a reasonable facsimile thereof return, expenditures may be cut far below the rate now considered likely. This still means that government expenditures will be a powerful economic impetus. Letting up slightly, however, will reduce the pressure in many quarters.

The planners in Washington now expect that the basic metal industries—steel, copper and aluminum—will operate at capacity for many years. Only a sizable expansion of capacity will relieve the problem. For steel, at least, they are looking forward confidently to the time when such additional capacity will be available. They expect similar shortages in the electrical manufacturing and electronics industries, and in the manufacture of tires and tubes. In soft goods, the problem of securing an adequate supply of wool will be around for a long time, but cotton may be available in abundance very soon.

By S. HERBERT UNTERBERGER

Of special interest is the fact that the pressure on building materials is expected to ease very considerably. Actually, there is some thinking that, should a peace come which looks like it will endure for a while, many of the severe restrictions on building construction may be lifted.

Peace Possibility and Controls

The official Washington position on controls follows logically from the official position on the rearmament program. If that program is going to continue at the scheduled rate, then severe shortages in materials and manpower are likely to result which will generate serious inflationary pressures on prices and wages. Hence, the Administration demand for strengthened price, wage and material controls.

	Scheduled Expenditure	Likely Expenditure
July 1, 1950 - June 30, 1951	$21 billion	$21 billion
July 1, 1951 - June 30, 1952	46 billion	Less than $40 billion
July 1, 1952 - June 30, 1953	65 billion	Less than $50 billion
July 1, 1953 - June 30, 1954	53 billion	Less than $40 billion

On the other hand, there is a strong and growing feeling that, with even a moderate reduction in the spending program, direct economic controls will be unnecessary. There is strong evidence that both sides are unsure of their positions. But, the balance of Congressional power is so unsteady that they are afraid to recede from those positions for fear that they will lose completely.

The Administration finds itself plagued by its inconsistency. It will be remembered that less than a year ago, when the Defense Production Act was being considered, it came out against strong price and wage controls. The powers provided by that act were practically thrust upon it. Now when Congress wants to take some of those powers away, the same Administration is objecting strenuously. It is not without some logic that many people are saying: "They were wrong then and they are probably just as wrong now." Apparently, no efforts are being exerted to achieve an intelligent compromise.

There is pretty general agreement that controls over materials are essential. This follows from the fact that many strategic materials are certain to be in short supply for a long period of time. It is unfortunate for both sides in the debate over price and wage controls that those controls are included in the same legislation with material and production controls. Extension of the present legislation would continue them all and a veto would destroy all of them. Either result would be undesirable to all concerned. What will happen eventually will be determined partially on straight political considerations and partially on what the inflationary situation looks like when the final vote is taken.

The Future of Inflation

Government and other economists have been saying for a long time that if goods are short inflation is sure to follow. And the World War II experience certainly demonstrated how that happened. Recent events, however, suggest that they have been overlooking a very important factor. To have inflation, it is also necessary to have buyers who are willing to pay almost any price for the scarce items.

There are many indications that this time the buyers are not nearly so willing to overpay. For example,

(*Continued on page 81*)

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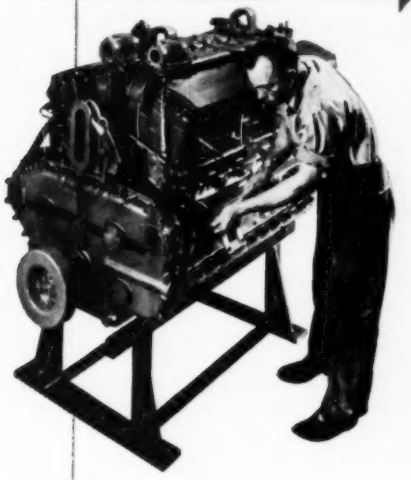

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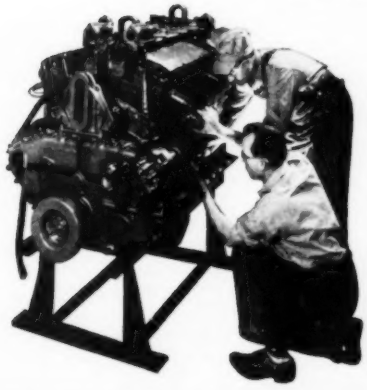

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PROGRESSIVE MANAGEMENT

Works Wonders With

New Jersey Quarry Property

By WILLIAM M. AVERY

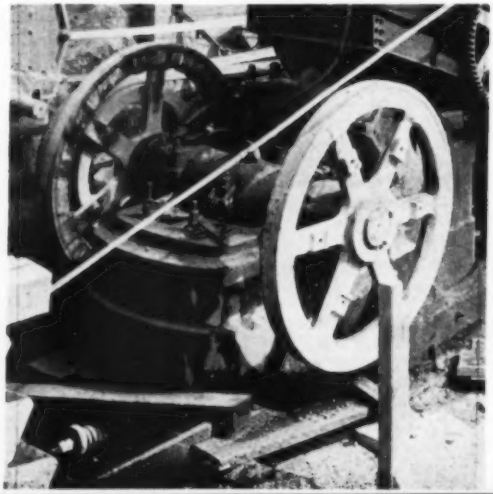
another ON THE SPOT report

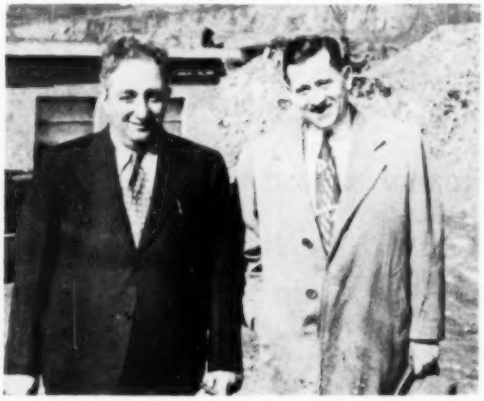
THE Somerset Crushed Stone Company, Inc., of Bernardsville, N. J., provides an outstanding example of what can be achieved by modern, progressive management techniques. When the present owner purchased the property in October, 1945, he acquired little more than a nucleus for a modern stone crushing operation, this despite the fact that the site had been worked continuously for almost half a century. No single phase of production, from quarry operation to delivery of the end product, was set up on an efficient basis, and even under optimum conditions an output of 300 tons per day was looked upon with awe.

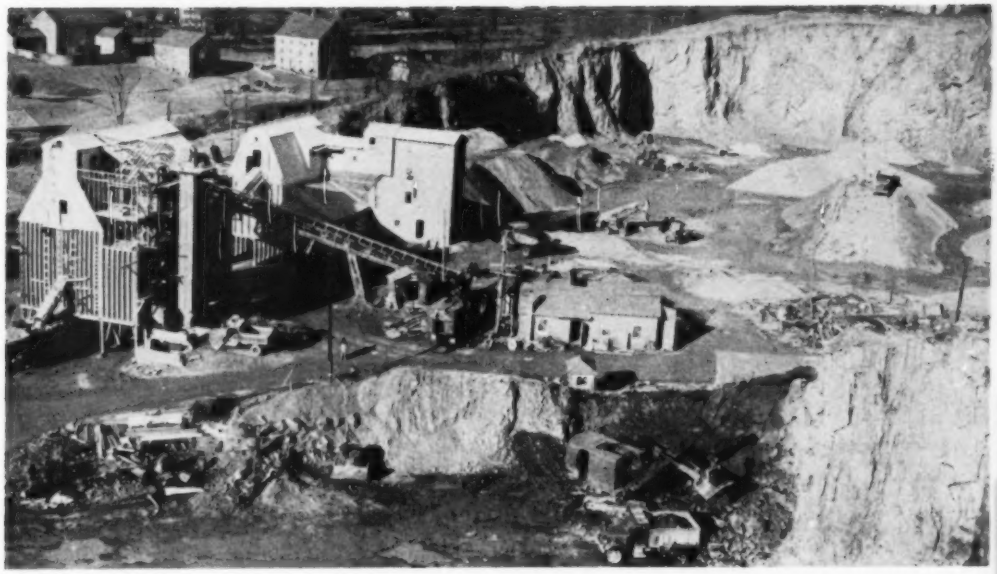
The peak output in any year had been approximately 60,000 tons, a rather poor showing in view of the fact that there was an apparent market for several times that amount of stone. Although lack of equipment unquestionably was a factor in holding down production, the real bottlenecks were in most instances a result of improper utilization of such equipment as was available. For example, all material, after passing through the primary crusher, was placed in stockpiles. To make smaller sizes it was necessary to stop hauling from the quarry while this stockpiled material was re-fed to the same crusher, involving not only a wholly unnecessary rehandling operation, but a complete cessation of production.

The new owner's first target was to eliminate as much of the rehandling of material as possible, and to set the plant up so that reasonably continuous output could be maintained. During the winter of 1945 a Kennedy No. 37½ gyratory

BELOW, LEFT: One remarkable aspect of the tremendous expansion of output at Somerset is that it has been accomplished with the same 36- by 24-in. jaw crusher which was serving the plant when the new owners took over. BELOW, RIGHT: Anthony Ferrante, owner and president, and Edward R. Boate, formerly superintendent of the Somerset plant and now vice-president of Bacon-Pietsch Co., Inc., N. Y.







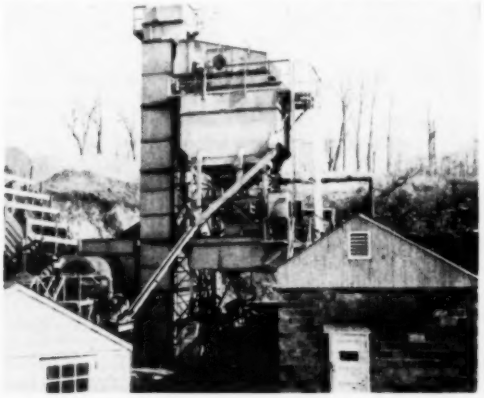
General view of the quarry and plant of Somerset Crushed Stone, Inc., Bernardsville, N. J. Building "B" referred to in the accompanying article, is at the extreme left.

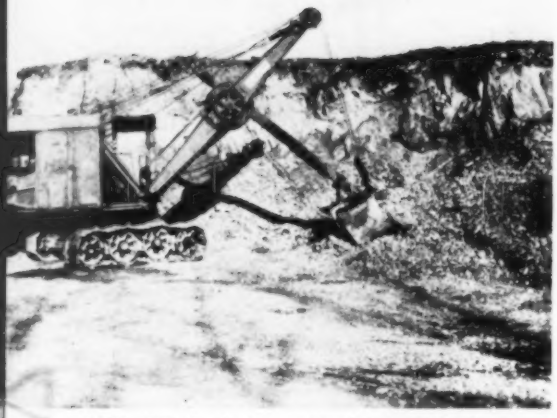
crusher was installed for secondary crushing. Two new Kennedy vibrating screens were also installed to augment existing screening capacity. With these additions, and a few other relatively minor changes, the output of the plant soared to around 900 tons per day during the following operating season.

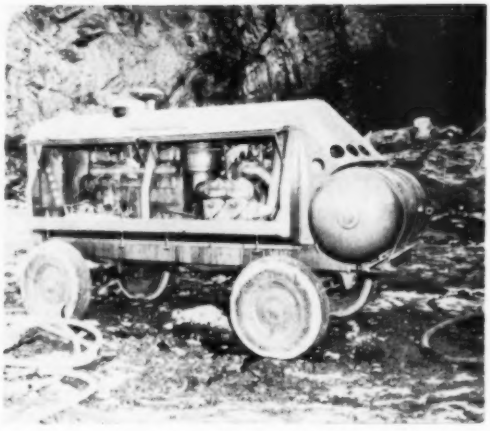
Since that initial achievement many additional changes have been made in the plant itself and in the methods employed, and each step taken has resulted in a measurable increase in output. Over a period of about five years every stage of the operation has come under close scrutiny with a view to eliminating bottlenecks and attaining maximum efficiency. None of the changes made has been dramatic in itself, but the results in terms of production strike us as being dramatic indeed. Output now ranges from 2,000 to 2,200 tons daily. Last year direct sales of crushed stone amounted to 368,000 tons, and in addition some 30,000 tons went out in the company's own ready-mixed concrete trucks, and an additional 18,000 tons was sold in the form of black top. The total of 416,000 tons, produced in about 200 days of actual operation, is approximately seven times the peak annual output ever attained by previous owners of the property. This tonnage was produced with the original 36- by 24-in. Farrel Jaw Crusher.

The original quarry property, consisting of about 12 acres, was worked as early as 1897 by an organization known as the Somerset Stone Crushing Co. Output averaged five or six tons a day, and the material was used primarily for road building in the immediate vicinity. Some modern equipment was in-

BELOW, LEFT: Last year, in its first full year of operation, this 2-ton batch mixing plant produced approximately 35,000 tons of asphalt paving material. BELOW, RIGHT: One of the two 2-cu. yd. diesel shovels used for loading quarry-type trucks at the face.







ABOVE, LEFT: Overburden consists of 30-ft. strata of trap rock in columnar formation which can be dug without blasting. This material is all sold for road base and shoulder base work. ABOVE, RIGHT: One of the 360-c.f.m. portable compressors which supplies air for drilling toe holes.

stalled in 1927, when the property was purchased by a local construction firm. From that year until its purchase in 1945 by the present owner the company was known as The Somerset Crushing Co.

Today the property comprises about 275 acres of land. Extensive core drilling indicates some 500,000,000 tons of usable stone, or enough, at the present rate of operations, to last for several centuries. The overburden consists of about 30 ft. of hard, dark brown material which is essentially trap rock except for its columnar structure. The stripping is done with a Thew-Lorain 55 shovel. No blasting is required, since the overburden formation readily breaks down into a product ranging from ½ in. to 3 in.

View of one of the well drills used for putting down blast holes.

To date there has been a ready market for more of this material than would normally be produced in stripping operations. Last year, for example, more than 100,000 tons was sold for use as road base and shoulder base material, and before the end of the current year the company expects to market at least 200,000 tons.

The present working face ranges from a high of 115 ft. to a low of 60 ft., with 80 to 85 ft. representing a fair average. Two well drills, a Keystone and a Sanderson Cyclone, are used for putting down the 7- to 8-in. diameter blast holes, and occasionally a third unit is hired. Burden and spacing are both normally about 20 ft., and the average blast ranges from five to seven holes. The holes are drilled to a depth of about 7 ft. below the quarry floor.

All primary blasts are handled by Atlas Powder Co. Since the quarry is fairly close to a residential area, delayed action blasts have been used to hold down vibration. This practice, since it was instituted several years ago, has also resulted in much better breakage, and currently only about 10 percent of the stone requires secondary breaking in the quarry. Large blocks are drilled with a wagon drill and blasted with dynamite, while smaller pieces are reduced to shovel size with a 4000-lb. drop ball. The drop ball is handled with a ¾-cu. yd. Thew-Lorain crane which has a 30-ft. boom. Air for secondary drilling and for drilling toe holes is supplied by two 360-c.f.m. portable compressors, one an Ingersoll-Rand and the other a Worthington Blue Brute.

Three 20-cu. yd. Euclid quarry-type dump trucks haul stone from the quarry face to the 36- x 24-in. Farrel primary jaw crusher. These are loaded with two 2-cu. yd. diesel shovels—a Thew-Lorain and an Osgood. The primary crusher is a 36- by 24-in. Farrel-Bacon Type B jaw crusher driven by a 92-hp. Allis-Chalmers slip-ring motor. About 20 hp. excess was provided in selecting this drive to facilitate starting under full load, a need that arises from time to time as a result of power failures. Although there is no means of reversing the drive, the extra power has made it possible to start up under any and all load conditions.

A 30-in. inclined belt conveyor elevates the stone from the jaw crusher to the top of the main plant building, where the stream of material is discharged on a 5- by 12-ft. triple-deck Kennedy-Van Saun Type AA vibrating screen. Openings on the top, middle and lower decks of this screen are 3-in., 1 7/16-in. and 1-in. respectively. Tailings (plus 3-in. stone) go by gravity to either of two Kennedy-Van Saun No. 37½ gearless crushers, while rejects from the two lower decks drop directly into bins as finished material or are fed to the same secondary crushers for further reduction.

Stone which passes through the bottom deck drops onto a 24-in. belt conveyor which discharges onto a 5- by 12-ft. double-deck Kennedy-Van Saun screen, with ⅝-in. openings on the top deck and 7/16-in or ⅜-in. on the bottom deck. Here ¾-in. stone, ½-in. stone, and screen-

ABOVE, LEFT: Truck discharging stone at the primary crusher. The loads average 25 tons. ABOVE, RIGHT: Stockpiles are conveniently close to the plant buildings, thus can be served with minimum trucking.

ings are taken out.

Feed for the No. 1 Kennedy-Van Saun crusher consists entirely of tailings from the triple-deck screen. Its product drops onto a 24-in. inclined belt conveyor which links together the main building and a secondary screening plant. The main structure and the secondary plant are designated as "B" building and "A" building respectively.

"A" building houses two Kennedy-Van Saun Type A screens, the first a 4- by 10-ft. double-deck unit, and the second a 4- by 8-ft. triple-deck. These two screens are joined by a 20-in. belt conveyor, and their products consist of 1½-, ¾-, ½-, and ¼-in. stone in addition to minus 8-mesh dust.

Feed for the No. 2 Kennedy-Van Saun crusher consists of 3-in. tailings from the primary screen, or 2½-in. and 1½-in. stone trucked to the unit from stockpiles. The product is lifted approximately 65 ft. by means of a 7- by 14-in. bucket elevator and discharged onto a 5- by 8-ft. triple-deck Kennedy-Van Saun Type AAA screen, with 1⅞-in., 1-in., and ⅝-in. openings on the various decks. Rejects go back to the crusher, while the throughs drop onto a 24-in. belt conveyor and are discharged on a 3½- by 6-ft. triple-deck Robins Style A screen, the products of which are identical with those produced on the triple-deck screen in "A" building.

To assure a virtually unlimited supply of fine material sized to close tolerances, the company recently installed a 30- by 22-in. Cedarapids double-roll crusher. This unit is tied in with the rest of the plant so that it can receive ¾-in. stone directly from either of two screens, or it can be truck-fed from stockpiles. Its product is elevated about 60 ft. and discharged on the 24-in. belt conveyor which feeds the Robins screen described above.

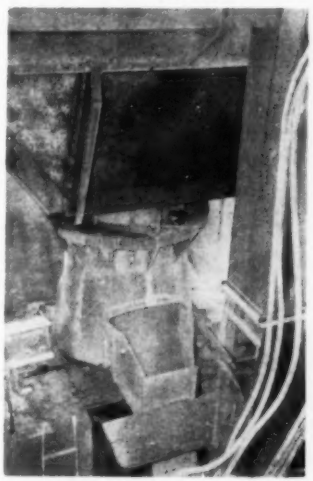
The present crushing and screening flow sheet is unquestionably somewhat more complex than would be required if identical facilities had been designed and installed at one time. What the company has achieved, however, is an almost infinitely flexible setup which makes it possible to produce vast quantities of accurately-sized materials with minimum rehandling.

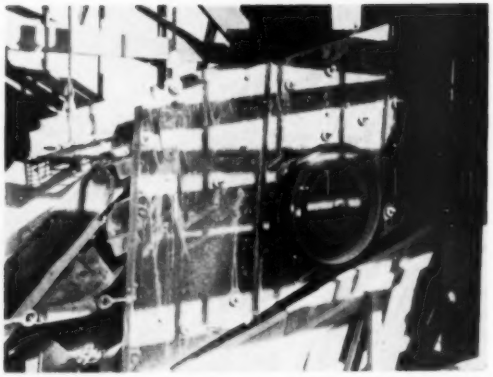
The company keeps large quantities of all sizes of material in stockpiles in order to be able to fill unexpected demands. The total amount in stockpiles naturally varies somewhat, but 150,000 tons represents a fair average. Materials are reclaimed from the stockpiles with a Haiss loader, a Michigan Power shovel and a Byers No. 83. The company owns and operates over 60 trucks for making deliveries alone, and during peak periods may hire as many as 30 to 35 additional units. Rail shipments also account for an important share of total tonnage. Shipments of ballast alone by rail this year will amount to about 30,000 tons. Cars are loaded from a truck ramp adjacent to the plant siding.

Activity at the Somerset plant is by no means confined to the production of crushed stone. The company operates a modern dry-batch plant served by 12 transit-mix trucks. Bins and other facilities for this operation adjoin the secondary screening plant so that there is virtually no rehandling of aggregates. Just recently a 1500-bbl. Heltzel bulk cement plant was installed to further facilitate the handling of materials. The former owners of the plant were operating a single 1-cu. yd. transit-mix truck when the property changed hands in 1945.

In 1949 the company installed a 2-ton F. D. Cummer hot and cold asphalt plant which was one of the first in the state to produce the new type "SM" state highway mix. Asphalt products are stored in three 20,000-gal. storage tanks, and the entire operation is electrified. In the first year of operation it produced 35,000 tons of material.

Two gearless crushers of the type shown here, and a 22- by 14-in. double-roll crusher, are used for secondary reduction.





ABOVE, LEFT: Scale-house operator Louie Ferrainolo weighs over 60,000 loads per year, knows from memory and within 50 lbs. the weights of more than 100 types of vehicles that haul from the plant. ABOVE, RIGHT: One of the 5- by 12-ft. triple-deck vibrating screens located in building "B."

In respect to facilities for maintenance and repair the Somerset plant is about as self-sufficient as any we are acquainted with in the crushed stone industry. In 1949, the company erected a large truck garage and repair shop for servicing wheel equipment and making general repairs to plant equipment. There is also a 15- by 30-ft. general stock room, and a 30- by 70-ft. room for tire storage and repairs. The tire inventory alone for company-owned trucks totals close to $50,000.

Machine shop equipment includes a lathe, several drill presses, three welding machines, and complete facilities for turning out shafts, bolts and a wide variety of items required in connection with both maintenance and construction work. The plant force includes five mechanics on day shift and three at night, in addition to three full-time welders and a blacksmith. All building and erection work is handled by the regular operating crew.

Somerset is a closed corporation wholly owned by Anthony Ferrante and his wife. Under the name of Anthony Ferrante & Son, Inc., Mr. Ferrante has been active in the contracting business since 1925. Purchase of the quarry property at Bernardsville was prompted in part by the desire to have an assured source of quality stone for use in road building and other aspects of the contracting business. We believe that to a large extent the tempo and efficiency of the quarry and crushing plant operation are direct results of Mr. Ferrante's wide experience in the rough-and-tumble contracting field, where a bottleneck or a fumble can mean curtains.

The Ferrante enterprises were further expanded in 1947 by the purchase of the Peapack Limestone Quarry at Peapack, N. J. Believed to be one of only two high-calcium limestone quarries in the entire state of New Jersey, this property at the time of its purchase had been in almost continuous production for about 150 years. Stone was broken with sledge hammers and hand

BELOW, LEFT: The FERRANTE NEWS, published monthly for the employees of A. Ferrante & Son, Peapack Limestone Quarry, Inc., and Somerset Crushed Stone Co., made its first appearance in March of this year. BELOW, RIGHT: One of the 12 transit-mix trucks which haul concrete from Somerset's modern dry-batch plant.

FERRANTE NEWS

VOL. 1, NO. 1 MARCH, 1951

Meet Our Newest Drilling Team

Emerson Tribbitt Heads Safety Club!

Agricultrual Operation To Begin Soon At Peapack

Joe Morse Passes Army Physical

Quarry History: 300 Tons A Month Top Production In The Old Days

Primitive Methods Used Until 1927

sorted to feed two 12-ft. diameter shaft kilns. The output of hydrated lime ran about eight tons per day. Under the new management an extensive modernization program was begun, and the production of hydrated lime was jumped to 15 tons per day. Early this year a crusher and pulverizer were installed to make agricultural limestone, and the output of this material now amounts to about 100 tons per day on a two-shift basis. Part of the product is loaded into spreader trucks for direct application to farms in the area, but the bulk of the output is bagged and sold throughout the east under the Peapack Limestone label. Both pulverized limestone and hydrated lime are shipped to the plant at Bernardsville for use in asphalt operations. The Peapack plant is under the supervision of Elmer P. Hess.

With 73 pieces of wheel equipment operating in and out of the crushed stone plant alone, the problem of safety has assumed considerable importance, and the company has adopted a well-planned safety contest for its drivers. Each off-premises driver receives one credit for each 50-day period of accident-free driving. At the end of the year a $250 fund donated by Mr. Ferrante is divided among the drivers who have earned credits.

To further such important causes as safety, and to help weld the employees of the three principal enterprises into an effective team, in March of this year the company launched a four-page monthly publication called the *Ferrante News*. This well-edited and attractively made-up newspaper is mailed each month to all employees of the three companies, and to customers and others with whom the firms do business. The paper is written, edited and produced by James C. Adams.

One certainty about the Ferrante enterprises is that they cannot remain static for long. The 50- by 60-ft. office building on the Somerset quarry property fairly vibrates with activity. During the summer months delivery operations start at 5:00 A.M. and continue without interruption until well into the evening. Mr. Ferrante personally supervises all sales activities, but he is also in close touch at all times with production, maintenance and personnel problems. Joseph H. Seguine is general manager of Somerset.

Among the important projects for which the company is currently supplying materials is the 118-mile New Jersey Turnpike. Somerset is supplying crushed stone for the sections of this modern super highway between Linden and New Brunswick and in the vicinity of the Heightstown Interchange.

Truck Weight Laws

(*From page 73*)

vide that the owner of any truck who causes it to be loaded to excess weight limits shall be fined from $300 to $500 for each offense.

Passed by the Michigan Senate and at this writing before the House was a bill which would levy penalties according to the size of overloads. The penalties would range from 2 cents per lb. for excessive loads of 2,000 lb. to 10 cents for loads 5,000 lb. over weight limits. In addition, fines of $500 could be assessed. Justices of the peace would be authorized by the bill to impound trucks until the penalties are paid and to order them sold in 90 days if the penalties are not paid.

A bill introduced in the New Hampshire legislature would increase the fine for overloading trucks and give inspectors increased authority to order drivers to unload or reload such vehicles. It also would give the state public works commissioner authority to fix weight limits of motor vehicles on certain roads and bridges.

Under a bill pending in the Ohio legislature, any person, firm, or corporation which is a habitual or intentional overloader would be subjected to a suspension of license to operate for not more than three years. Another section of the measure would provide that with the arrest of a driver, the arresting officer shall notify the person or firm holding such certificate and also the State Public Utilities Commission and the state director of highways.

Pending in the Pennsylvania legislature is a bill which would provide for an additional $5-per-ton fine on top of a basic $25 fine for each one ton of truckload overweight exceeding 10 percent of the lawful load limit.

A bill which would provide heavier fines for overloading was passed by the Wisconsin Senate and at this writing awaited House action. Fines would be on a sliding scale of 2 to 10 cents per lb. where the overload is more than 1,000 lb., plus fines of $50 to $100 for the first offense and $100 to $200 for the second offense. Present Wisconsin law provides for no sliding scale and for fines up to $100.

Washington News

(*From page 74*)

despite dire prelictions, no signifl-cant black market has been developing in meat. Buyers are just failing to buy and stocks are piling up. Recent distress sales of consumer durable goods are another illustration.

It is just beginning to be recognized that consumers may not repeat their previous behavior pattern. It is being remembered that World War II followed a long period of depression when consumers were starved for goods which they tried to buy as soon as they had the purchasing power—regardless of the price. Now many consumers are well stocked, even surfeited, and they are being much more careful.

Every year the Federal Reserve Board makes a study of Consumer Finances in which the economic behavior and expectations of a sample of American families is studied. The results of that study throw much light on what is happening. That survey found that the earnings' increase in 1951 set a record for any year in the post-war period. Nearly half the families reported increased earnings over 1950; only one-fifth reported decreases.

But they did not rush out and spend all their increased income. There was an increase in the proportion of families owning liquid assets — Government bonds, bank accounts, etc. This was a reversal of a downward trend which began in 1947. Also, in 1951, the proportion of families which spend more than they earn is declining.

The survey shows that most consumers expect prices to rise. Despite that belief, about half of them said that this was a bad time to buy durable goods because prices were too high. Furthermore, most families still planned to put their savings in Government bonds and most of them who were to receive funds from bonds maturing in 1951 and 1952 expected to reinvest directly in noninflationary investment.

Consumers planned to purchase fewer automobiles in 1951 than in 1950 and just about the same volume of other consumer durable goods. Roughly the same number of families were considering the purchase of a house in 1951 as in 1950. However, somewhat fewer were definite about their home purchasing plans. This was caused by uncertainty about the availability of credit and of materials and prices.

Clearly, consumers are not doing any more rushing into the market. This is the healthiest sign yet that serious inflation may be prevented.

Dust Problem Solved Effectively At Huron Portland's Cleveland Plant

WHEN fine bulk materials are conveyed into bins and silos, a dust condition is often created at the bin vent. Such a condition is always a nuisance, and in most cases it means the loss of a valuable product. One way of eliminating this dust condition is to install a comparatively small cloth-type dust filter. Typical examples of these installations can be found in many cement plants where cement is either pumped or conveyed to silos.

The Huron Portland Cement Company's distributing plant near downtown Cleveland, Ohio, offers a good example of this type of dust loss prevention. This plant, built in 1916, is located on the Cuyahoga River. All its cement is received by boat from Huron's Alpena, Mich., mill. Three lake boats operated by Huron's transportation company unload portland and mortar cement here for distribution to Cleveland and the surrounding area. Ample storage facilities carry the plant through the winter months, when navigation is closed.

The bulk cement is unloaded from the boats by Fuller-Kinyon pumps and elevators and is discharged into screw conveyors which carry it to any one of the 12 silos for storage. Each silo is 80 ft. high and approximately 22 ft. in diameter.

In the penthouse over the silos a Dynaclone dust filter, a recent development of the W. W. Sly Manufacturing Company of Cleveland, is mounted directly over one of the 6 silo star bins. Air from the Fuller-Kinyon system is vented here through a 9 in. pipe to the filter. The dust collector, with its series of cloth bags, filters the dust out of the air so that nothing but clean air is discharged to atmosphere.

The Dynaclone installation at Huron's distributing plant has 30 filter bags, with a total cloth area of 660 sq. ft. Filter and fan are designed to handle 2,000 cu. ft. per minute, although only about 1,600 cu. ft. per minute are delivered by the air compressors. This extra volume capacity insures a negative air pressure in the bins and unloading equipment.

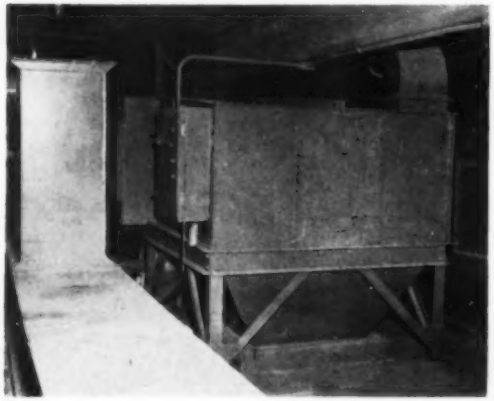
Efficient operation of the filter is assured by a device within the filter housing which travels constantly across the open ends of the filter bags, blowing atmospheric air

(*Continued on page 92*)

• The distributing plant of the Huron Portland Company at Cleveland, O.

• Right: Unloading bulk cement by air pump into the elevator beside the silos.

• A closeup of the dust filter venting the large elevator used for bringing cement from the boat to the top of each silo.



A. S. T. M. Convenes in Atlantic City For 54th Annual Meeting

By C. E. PROUDLEY
Chief Materials Engineer
North Carolina State Highway and Public Works Commission

ANNUAL meetings of the American Society For Testing Materials are becoming more noteworthy each year for the variety of materials and materials interests which are included in the scope of its activities. Spreading over five hotels, using at least 45 meeting rooms, and continuing from Sunday through Friday, June 17-22, there were 584 scheduled technical meetings and 25 general sessions at this year's annual meeting. No less than 2265 registered members and visitors attended. Work began at 9 o'clock each morning and frequently continued until well on towards midnight. Even though held in Atlantic City and favored by the finest weather the society has been privileged to enjoy, the meeting was marked by an atmosphere of concentration and scientific endeavor.

A Symposium on Surface and Subsurface Reconnaissance occupied two of the general sessions. Its purpose was to assemble information on techniques that have been applied to this type of reconnaissance in widely varying scientific fields, and examine these techniques for their limitations as well as their applications. The 15 papers were divided into four groups: pedologic, geologic, air photo, and geophysical. As has been pointed out in previous reports of Annual Meetings of the Society in PIT AND QUARRY by your author, the latter should be of particular interest to the non-metallic mining industry. Among the papers on geophysical methods were *Measurements of the Depth of Weathered Mantle Rock* by Dart Wantland, geophysicist, Bureau of Reclamation, Denver, in which he gave examples of results showing that the geophysical and core drill determination of the depth to sound rock agreed within less than 4 feet. Another paper was by W. F. Abercrombie, testing engineer, State Highway Department of Georgia, Atlanta, on the *Practical value of an Earth Resistivity Method in Making Subsurface Explorations.* D. Linehan, Boston College, reported on *Seismology Applied to Shallow Zone Research.*

C. E. Proudley, author of this report and chief materials engineer of the North Carolina State Highway and Public Works Commission, reported a tentative specification for bituminous surface aggregate to the association.

Committee C-18 on natural building stones under the chairmanship of L. W. Currier, U. S Geological Survey, reported that the proposed specifications for roofing slate is being held over in order to give the producers more time to properly consider them Also, the method of test for durability of slate for roofing purposes is being continued as tenative while additional information is secured on samples to be submitted by the industry. The same situation exists for the proposed specifications for exterior marble since the Association of Marble Producers is now actively engaged in an extensive research program. Committee C-18 has been requested to develop a specification for limestone as a building material and as the first step in this work the limestone producers are to be circularized for suggestions as to the need for and the form of such a specification. This committee was particularly pleased to have one of its members, D. F. Kessler, chief, Building Stone Section, National Bureau of Standards, receive the society's Award of Merit.

Concrete Pipe came in for a number of changes both in specifications and methods of testing by Committee C-13 as reported by Chairman W. W. Horner of Horner & Shifrin, St. Louis, Mo., and Secretary H. F. Peckworth, American Concrete Pipe Association, Chicago, Ill. Standard specifications C-14 and C-75 for concrete sewer pipe, C-76 for concrete culvert pipe and C-118 for concrete irrigation pipe have all been recommended for revision to permit the use of air-entraining portland cement (C-175), and portland blast-furnace slag cement (C-205) as well as the standard portland cement (C-150). Also, admixtures or blends may be used with the approval of the consumer.

The maximum size of aggregate to be permitted in concrete culvert pipe (C-76) is to be one-third the shell thickness in the barrel of the pipe. Reinforcement welds, either at intersections or splices are required to develop a tensile strength of not less than 52,500 p.s.i. A Clarification of Table I in the Specification for Concrete Sewer Pipe (C-14) is made by changing the word "Average" in the heading of the second column to "Minimum." This ap-

A. T. Goldbeck, engineering director of the National Crushed Stone Association, was made an honorary member of A.S.T.M. as special recognition for his many years of contributions and service to the society.

Howard F. Peckworth (above) of the American Concrete Pipe Association co-reported a number of changes in specifications and methods of testing concrete pipe with the chairman of Committee C-13, W. W. Horner.

plies to strength requirements of the pipe.

In the sewer pipe specifications "hydrostatic tests" has been changed to "permeability tests", and the test is now performed by placing the section of pipe with the spigot end down on a soft rubber mat or its equivalent, weighted if necessary, and filled with water to the level of the base of the socket for 15 minutes.

In the method of crushing strength of pipe it is now required that "The load shall be applied through a rigid steel member capable of distributing the load equally throughout the entire length of the 6- by 6-in. wooden bearing block." Other details of the set-up for the crushing strength test are described more definitely and it will pay the manufacturers of concrete pipe to secure the new specification when it is available since the changes favor him in most respects. It should be of interest also to follow the progress of the cooperation between this committee and the American Association of State Highway Officials in considering the following: 1) The desirability of eliminating the ultimate failure test from the concrete pipe specifications; 2) The desirability of eliminating the sand bearing test; 3) The desirability of using cores for testing the strength of the concrete in concrete pipe.

A subcommittee of C-13 has been formed and delegated the task of preparing a specification for reinforced-concrete low-head pressure pipe. Another subcommittee is preparing a draft of a recommended practice for bedding and backfilling of concrete pipe lines.

A revised Recommended Practice for Laying Sewer Pipe (C 12-19) has been completed by Subcommittee II on specifications (J. O. Everhart, chairman) of the Committee C-4 on Clay Pipe, of which J. C. Riedel, Board of Estimate, New York, is chairman.

A method of making vibrated dry-tamp concrete cylinders applied to tests of lightweight aggregate and block mixtures was presented in a paper at a general session by S. B. Helms and A. L. Bowman, Lehigh Portland Cement Co, Allentown, Pa. They pointed out that hand tamped specimens made in the laboratory are unrealistic and of questionable value. They used a vibrating pedestal to which the 3- by 9-in. split tube cylinder form is fastened and the specimens molded in three lifts using a superimposed plunger weight. The coefficient of variation within a batch of 20 cylinders was 3.3 percent. The maximum leviation of the batch average (5 batches of 4 each) was 3.0 percent and the average deviation among batches only 1.6 percent.

As a result of considerable deliberation committee C-1 on cement, has recommended a tentative definition of the term "pozzolan" as follows: "The term 'pozzolan' is used to designate a siliceous or aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties." Under the chairmanship of R. R. Litehiser, Chief Engineer, Ohio State Highway Testing and Research Laboratory, several subcommittees have recommended new tentative methods and revisions of tentatives to the society. The tentative method of test for time of setting of hydraulic cement by the Gillmore Needles has been separated from the present Methods of Test for Time of Setting (C 191-49) in order to secure increased certainty in setting time references in specifications. In operation the penetration of the 1-mm. needle is determined every 15 minutes (every 10 minutes for type III cements) until a penetration of 25 mm. or less is obtained. By interpolation, if necessary, the time required to reach a condition of 25 mm. penetration is recorded as the setting time. A revision in the Standard Specifications for Masonry Cement (C 91-49) for immediate adoption was requested to take advantage of the reference to the Tentative Specifications for Flow Table for Use in Tests of Hydraulic Cement (C 230-49T). This change is in line with the last revision in Standard C 109. The Standard Specifications for Portland Blast-Furnace Slag Cement (C 205-48T) are recommended for revision to permit the use of air-entraining additions covered by the requirements of Tentative Specifications for Air-Entraining Additions for use in the Manufacture of Air-Entraining Portland Cement (C 226-50T). Also, delete the tensile strength requirements for type IS-A cement thereby making this specification in closer conformity with the Tentative Specifications for Air-Entraining Portland Cement (C 175-50T). Of interest to cement chemists will be the proposed tentative revisions in the Standard Methods of Chemical Analysis of Portland Cement (C 114-47).

William H. Klein, long a member of Committee C-1 was one of the ten society members to be given the Award of Merit this year for intensive work and contributions in their several fields and for aiding in numerous ways in futhering the general activities of the society.

H. F. Gonnerman and William Lerch, assistant to vice-president in charge of research and development, and manager, Department of Applied Research, respectively, of the Portland Cement Association, presented interesting information on *Changes in Characteristics of Portland Cement as Exhibited by Laboratory Tests Over the Period 1904 to 1950* secured from analyses of the laboratory cements for the past 35 years in addition to more than 131 cements studied during this period in connection with special investigations.

Fourteen tentative methods and specifications concerned with magnesium oxychloride cements were presented to the society by Committee C-2 under the chairmanship of Dr. L. S. Wells, chief, Lime and Gypsum Products Section, National Bureau of Standards. Among these were Physical Testing of Magnesia for Magnesium Oxychloride Cements (C 246-50T); Slump Test for Field Consistency of Magnesium Oxychloride Cements (C 249-50T); Tests for Linear Contraction of Magnesium Oxychloride Cements (C 252-50T); Test for Setting Time of Magnesium Oxychloride Cements (C 254-50T); Test for Flexural Strength of Magnesium Oxychloride Cements, Using Simple Bar with Two-Point or Single-Point Loading,

(C 256-50T); Test for Compressive Strength of Magnesium Oxychloride Cements (C 257-50T); and, Field Determination of Specific Gravity of Gauging Solutions for Magnesium Oxychloride Cements (C 250-50T).

Committee C-9 on Concrete and Concrete Aggregates recognized the valuable services of two of its number by making them honorary members of Committee C-9. They are Prof. F. E. Richart and M. O. Withey. Professor Richart was further honored by the society by being one of the five to be made honorary members of the A.S.T.M. Other honors conferred by Committee C-9 were the Sanford E. Thompson Award for a paper of outstanding merit on concrete and concrete aggregates presented to the Society. The award was made to R. C. Mielenz, L. P. Witte, and O. J. Glantz of the U. S. Bureau of Reclamation for their paper on *Effect of Calcination on Natural Pozzolans* which was described in some detail in last year's report of the annual meeting of the A.S.T.M. in PIT and QUARRY.

Activities of the subcommittees of Committee C-9 under the Chairmanship of K. B. Woods resulted in the acceptance by the Administrative Committee on Standards of the recommendations for publication of Tentative Specifications for Air-Entraining Admixtures for Concrete (C 260-50T), and a revision of the Tentative Methods of Testing Air-Entraining Admixtures for Concrete (C 233-49T). Considerable work has gone into the recommended revision of the Tentative Method of Test for Fundamental Transverse Frequency of Concrete Specimens for Calculating Modulus of Elasticity (Sonic Method) (C 215-47T), and the accuracy of this method has been improved through the efforts of subcommittee members and collaborators.

Continuing with the recounting of honors bestowed upon members of Committee C-9, Stanton Walker who has been secretary of this committee for many years was given the Award of Merit by the society. This year also marked his retirement as Secretary of C-9, his successor being Bryant Mather, chief, Special Investigations Branch, concrete Research Division, Waterways Experiment Station, Jackson, Miss.

The many friends which A. T. Goldbeck, engineering director, National Crushed Stone Association, has among the readers of PIT and QUARRY will be gratified to learn that he was given special recognition for his many years of outstanding contributions and service to the society by being made an honorary member of the society. Of the other four so honored this year, not mentioned elsewhere in this article, many readers are acquainted with Harold H. Morgan, vice-president and chief engineer, Robert W. Hunt Company who has been added to the society's list of 22 honorary members making the present total 27.

The time of setting of concrete has been the object of much speculation for many years. E. A. Whitehurst, research engineer, Joint Highway Research Project, Purdue University, presented a paper on the *Use of the Soniscope for Measuring Setting Time of Concrete*. Very stiff concrete was mixed and molded into 4- by 4- by 16 in. forms from which the ends were removed immediately and soniscope tests for velocity of impulse through the concrete begun at once and continued at short intervals for 8 hours or more. The speed of impulses began at about 4000 ft. per second and increased rapidly to a period at which there was a sudden change in rate of gain in speed. This point was taken as the time of set of the concrete. Compared to the Gillmore time of set of the cement used in the specimens, four cements were determined to be 5:45, 6:50; 4:15 and 8:00 and the corresponding time of set for the concrete was 5:45, 7:10, 5:00 and 7:40.

Permeability Tests of Lean Mass Concrete, by Herbert K. Cook, chief Concrete Research Division, Waterways Experiment Station, Corps of Engineers, were described in a paper telling of work done and information secured up to one year on concrete having cement contents of 2.00 to 3.00 bags per cu. yd., using 2½-in. aggregate but with water ratios which would be used in full mass concrete where the aggregate would be graded up to 6-in. The tests are to be continued and reported at 2 and 5 years. The pressure was 200 p.s.i. on a 14½-in. diameter specimen 15-in. in height. Type II cement with an air-entraining agent and sand and gravel from sources being used on the Pine Flat Dam, Kings River, Cal., were used in the mixtures. The data were given but no conclusions drawn at this time.

Abrasion Resistance of Air-Entraining concrete was the subject of a paper by L. P. Witte and J. E. Backstrom, materials engineers, Bureau of Reclamation, Denver. The maximum size of aggregate was ¾-in., water ratios varied from 0.4 to 0.7 and the air content ranged from 0.2 to 16.8 per cent. Abrasion was accomplished by the shotblast test in the laboratory and correlated with erosion in water flowing at high velocities. The major conclusion was that air-entrainment affected the abrasion resistance to the same extent that the compressive strength of the concrete is affected by air-entrainment, or expressed in other words, abrasion resistance and compressive strength vary inversely with voids-cement ratio, regardless of water-cement ratio, water, cement, or air contents.

Two of the general sessions of the society's program were devoted to a symposium on flame photometry. This tool of analytical chemistry has developed rapidly in the past few years with the introduction of commercially available flame photometers. As expressed by J. L. Gilliland, Bureau of Reclamation, in a paper on *Application of Flame Photometry for the Analysis of Alkalies in Silicates, Waters, and Metals*, the speed with which analyses can be performed with the flame photometer and the simplicity of its operation have been responsible for its ready adoption in materials investigations. The determination of the alkali metals especially are so time-consuming and the reagents so expensive or difficult to obtain that they have been totally ignored whenever possible. In addition to its application to routine analyses formerly handled by "wet" methods, it permits new problems

H. F. Gonnerman, assistant to the vice-president in charge of research and development, Department of Applied Research, Portland Cement Association, was the co-author of a report on "Changes in Characteristics of Portland Cement as Exhibited by Laboratory Tests Over the Period 1904 to 1950."

W. C. Lerch, manager of the Department of Applied Research, Portland Cement Association, who cooperated with H. F. Gonnerman on the report in changes in portland cement during a 46 year period.

to be tackled, problems which had been avoided because of the number of alkali determinations involved. The advancement of flame photometry was reviewed by V. M. Meloche, University of Wisconsin, followed by ten papers in the two sessions describing its use in such fields as biological fluids, by C. L. Fox, Jr., and Elizabeth B. Freeman, College of Surgeons, Columbia University; the determination of alkalies in portland cement using the Beckman and Perkin-Elmer flame photometers, by J. J. Diamond and B. L. Bean, National Bureau of Standards; and lithium oxide in portland cement by W. J. McCoy and G. G. Christiansen, Lehigh Portland Cement Co. Unexpected elements have shown up when using a recording flame photometer which otherwise might have been overlooked, according to W. H. King, Jr., and William Priesley, Jr., of the Esso Laboratories, who reported on a modified recording flame photometer. It is an instrument well suited for the rapid and reasonably accurate determination of sodium and potassium in industrial water and water-formed deposits, say R. K. Scott, V. M. Marcy and J. J. Hronas, of Hall Laboratories, Inc., Pittsburgh. They refer, among many other uses, to the importance of analysis in connection with boiler feedwater.

A study of the effect of amount of alkali in portland cement on the resistance of concrete to freezing and thawing was presented by Bailey Tremper, materials and research engineer, Washington Department of Highways, Olympia. Fifteen cements varying in alkali content from 0.15 to 1.34 per cent expressed as Na_2O were made into concrete freeze-thaw specimens using several aggregates occuring in the state of Washington which exhibited good resistance when mixed with low alkali cements. With one aggregate the durability factor began to fall off rapidly when more than 0.5 per cent alkali cement was used and for the other aggregate the average curve indicated that about 0.7 was the critical point. The entrainment of 3 to 6 percent total air improved the resistance of the former aggregate to the extent that it appeared to be equal to the use of low-alkali cement.

A report on further studies to develop an accelerated test procedure for the detection of adversely reactive cement-aggregate combinations was the subject of a paper prepared by T. E. Stanton, materials and research engineer, California Division of Highways, Sacramento. The tests which he reports support a proposed change in the seal container procedure which is currently under consideration. The magnitude of the reaction may be materially accelerated by increasing the percentage of mixing water to produce a flow of 140—150 instead of limiting the water to that amount which will produce a flow of 100 — 115 as designated in C 227-50T.

Committee D-4 on Road and Paving Materials, of which the author of this article is chairman, reported that a Tentative Specification for Crushed Stone, Crushed Slag, and Gravel for Single Bituminous Surface Treatment (D 1139-50T) was presented to the Society through the administrative committee on standards for publication. Of interest to producers of mineral aggregates is the work of a subcommittee of D-4 which has been endeavoring for a number of years to develop a quantitative measure of the "stripping" of bituminous films from aggregates. Results of cooperative studies have not been encouraging thus far but work on this difficult problem is being continued. Another subcommittee completed an investigation of the crushing tests of sands which is appended to the report. It was concluded that this type of test offered little hope as an over-all measure of particle strength.

As the result of the work of Subcommittee III of Committee C-12 on Mortar for Unit Masonry, Chairman J. M. Hardesty and this committee has recommended the publication of tentative specifications for mortar for unit masonry. These specifications cover five types of mortar for use in construction and are divided into two parts, one giving property specifications in which the acceptability of the mortar is based on the properties of the ingredients and the properties of the mortar mixed and tested in the laboratory, and the other based on the properties of the ingredients and the proportions of the ingredients. In the first part the mortars are designated by letters for each of which minimum average compressive strengths at 28 days are stated. They are A-1, 2500 p.s.i.; A-2 1800 p.s.i.; B, 750 p.s.i.; C, 350 p.s.i.; and D, 75 p.s.i. In the second part the same letter designations are used but without strength requirements, merely giving the mortar proportions by volumes of cement, hydrated lime or lime putty, and aggregate. It states in a note that "Plasticizing agents other than lime may be used with the approval of the building official."

More efficient and accurate methods for determining the amount of iron and the settling rates of lime were the objective of much cooperative testing by members of Committee C-7 on Lime under the chairmanship of Walter C. Voss, head, Department of Building Engineering and Construction, Massachusetts Institute of Technology. Research activities have also been concentrated on the development of a new slaking test for lime.

A paper by J. A. Murray and H. C. Fischer, Associate Professor and Research Professor, respectively, of the Massachusetts Institute of Technology, on *A Study of White Coat Plaster by Differential Thermal Analysis* concluded, among other things, that the results of their investigation neither discredit nor substantiate the theory which places the blame for plaster failures solely on the presence of unhydrated magnesia and its subsequent hydration to $Mg(OH)2$ with disruptive expansion. Other factors which they recommended for consideration were (a) the partial dehydration of gypsum on a wall as a function of temperature and humidity; (b) the factors influencing precipitation conditions and the growth of precipitated particles, and; (c) the calcium compounds, their physical condition, and the chemical reactions in which they take part or are produced.

The Committee on Thermal Insulating Materials, C-16, E. R. Queer of the Pennsylvania State College, chairman, submitted three

(*Continued on page* 106)

Mechanics, Techniques and Economics of Expanded Clay-Shale Aggregate Production

PART VI—PROCESS HEAT REQUIREMENTS

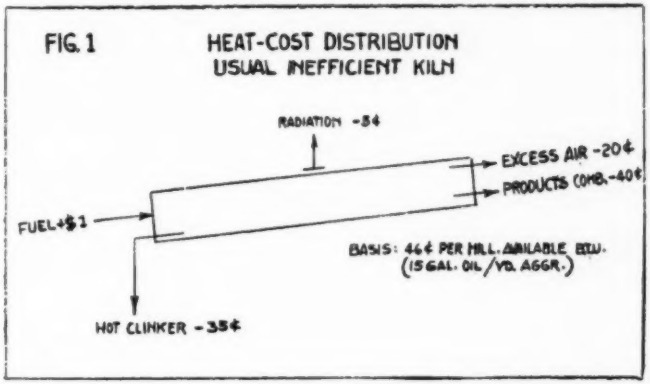
By WOLF G. BAUER
Consulting Engineer

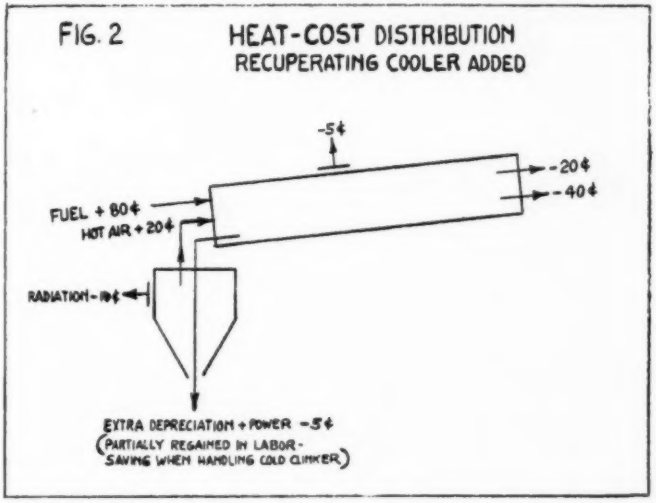
THE efficiency of a kiln, and we are referring to rotary-type kilns, must be measured primarily in terms of total burning cost per yard of clinker or aggregate produced. There are a number of ways to reduce fuel costs, but if the expense of additional power, heat-exchange equipment, fuel heating, etc., outbalances the savings, the efficiency of a burning system based only on fuel used is misleading in the overall analysis or comparison. To produce a cubic yard of aggregate at the minimum cost for fuel, power, maintenance, labor, and depreciation, a kiln system composed of burners, cooler recuperator, kiln, preheater, controls, and power application must be designed as an integrated heat and materials transfer unit from feed to discharge end. Simply to stick a burner into one end of a rotating cylinder and allow hot gases and hot clinker to spill out of each end is a practice which may have been accepted 50 years ago when the rotary first came into use for calcining materials, but it is no more in place today than the heating of homes by only radiation from a fireplace. Just the same, new plants in the industry are springing up designed without the slightest apparent concept of the thermodynamics applicable to the process. It is hoped that this series of discussions will help operators to achieve low-cost processing and aid them in understanding just what they can expect of their kilns in the way of fuel consumption and capacity.

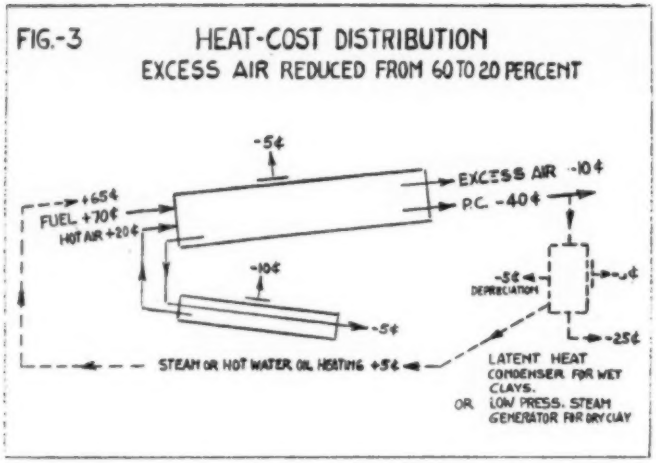
Heat Requirements The quantity of heat necessary to accomplish the pyrochemical process of bloating a clay or shale varies with the following factors: (1) the moisture content of raw material above a certain minimum; (2) the "available" B.t.u.'s of the fuel influenced by hydrogen and moisture content; (3) the time-temperature relation, as well as the level of the process for the particular material; (4) the design (if not existence) of the heat transfer equipment such as dryer, preheater, kiln, cooler recuperator, and gas seals; (5) the through-put in relation to the maximum possible; and (6) the process demand on flame and kiln gas conditions limiting combustion efficiency. Thus it may be seen that comparisons of plants in which these conditions vary are neither fair nor do they always lead to worthwhile conclusions. The only common denominator is the basic heat load requirement, to which must be added the various heat losses. It is therefore most important that the plant operator understand just what heat losses are recoverable, which are not, and how much investment is justified in providing equipment for the recovery of those which are recoverable.

There must be a starting point for computation, which is, of course, the theoretical heat requirement for heating the clay to the process temperature. That is relatively simple. The second step, on the other hand, namely how much extra heat is needed under the best possible practical conditions, requires making assumptions which touch upon process and design variables for each individual case.

What Limits Heating Efficiency? To keep things simple and nontechnical, we will not go into fundamentals of heat transfer or combustion. Earlier articles appearing in





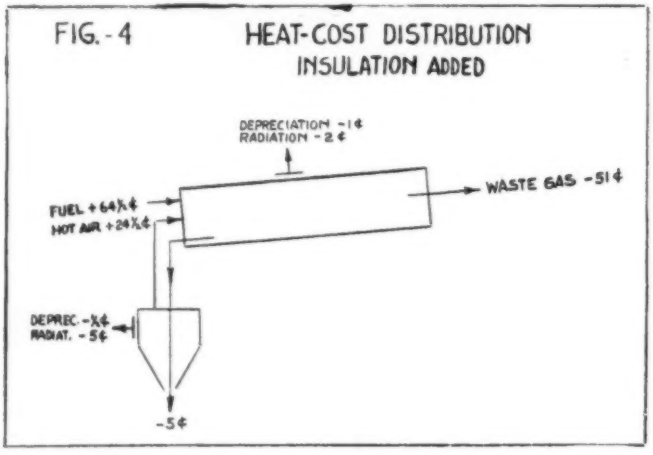


"The Plant Operator" have treated the subject to some extent in various heating applications. The heat transmission speed or rate is, however, the key to all our heat engineering, for it treats heat quantities as well as heating time. Whether 10 or 20 gallons of oil is used to produce a cubic yard of aggregate, when the clay or shale has reached a certain maximum process temperature, it contains always the same number of absorbed heat units or B.t.u.'s That should be kept in mind. It follows then that when more heat units are used than are absorbed by the clay, the extra heat is present somewhere else, *i.e.* in the kiln mass, in the air and ground surrounding the kiln, and in the hot gases escaping the system.

If we had a system without friction, perpetual motion would obtain, once started. If we had a system without heat loss or perfect insulation surrounding such a system, heat content within would remain perpetually constant, once applied. Thus we know that if we applied extensive insulation to our kiln system, we could reduce radiation heat losses to a very small minimum. Then why cannot the heat requirement be reduced to such an absolute minimum? That question, and it is an important one, may be answered as follows: the hot gases which impart their heat to the clay must be at a sufficiently higher-than-clay temperature to cause the necessary heat to be transferred at a *rate* which is within the economic needs of capacity and cost of the system. Let us examine this statement, for there is a great amount of confused thinking on this in the industry.

The greater the temperature difference between gas and material, the higher the heat transfer rate. If a kiln is extremely long, and the heat input is kept constant as the kiln is made longer and longer, it should be obvious that the heat transfer rate becomes increasingly less as gases and material show less and less temperature differential toward the feed end. If such a kiln were theoretically perfectly insulated, it would be impossible ever to have a kiln long encugh to obtain complete utilization of heat in the gases because there must always be a difference to cause heat to flow. Since kilns cannot be insulated perfectly, radiation loss brings the gas temperature down finally to the material temperature. It should be apparent that the time required to transfer heat, when only very small temperature heads exist, is much too long from a commercial and economical aspect; and so for every system there is an optimum kiln length in relation to heat transfer and degree of insulation applied, beyond which additional length is measured only in additional thermal efficiency but not overall process efficiency, upon which we are basing our discussion. The various illustrations showing heat distribution are, therefore, based on either the fuel cost or the overall cost including the extra power and depreciation charged against fuel savings.

Since the rotary kiln is not efficient as a convection heat-exchange apparatus, simply increasing its length for the sake of pre-heating improvement is not good practice. Extra length beyond the ratio of 1:15 is indicated for very wet clays, and there only to increase the time factor for drying. Since convection heat transfer is also influenced by gas velocity, improvements in this zone must come from applied engineering toward increasing material surface and gas contacts, as well as scrubbing velocity. More about this later.



Basic Heat Load In establishing a basis upon which heating requirements may be computed, a number of assumptions must be made and always kept in mind. To heat the dry cold clay or shale to bloating temperature requires that a certain amount of heat be absorbed by the clay only. This requirement varies with the material, mainly due to the fact that clays and shales are composed of various salts and minerals, and that some of these, such as accessory $CaCO_3$, $MgCO_3$, $CaSO_4$, or basic aluminum silicates such as kaolin, containing volatile compounds which require extra dissociation heat beyond that

of simple heating. On the other hand, there are also exothermic reactions which give off heat in certain silicate crystallization and oxidation reactions. For the present purpose we shall disregard such heats to keep the issue clear.

In line with this policy of staying non-technical as far as possible, the following assumptions as to "normal" processing conditions will be made and used as a basis upon which heat distribution and requirements will be compared. The shale enters the kiln or useful heating zone as bone dry; it shall contain 7 percent chemical water from the clay molecule plus other ignition losses; it shall have a bloating temperature of 2150 deg. F. and a specific heat of 0.28.

For comparison, of course, fuel ratios and costs should be given on a per ton basis and then converted to the bulk volume for each particular aggregate.

However, for the sake of quick comparison checks, and keeping in mind that the discussion centers on a typical aggregate, we shall feel warranted to base all figures on a per-yard denominator, the assumption being that a cubic yard of bloated aggregate weighs 1200 lbs. We shall also use fuel oil as the indicated fuel, but show B.t.u.'s for comparison basis with other fuels. Gas temperature in the hot zone of the kiln will be taken as 2650 deg. F., or a 500 deg. differential in the bloating zone. A "normal" fuel consumption of 15 gallons of bunker C fuel oil per cubic yard of aggregate will be our starting point of heat analysis, since we know that a number of kilns operate under these conditions at various locations. (Capacity does not enter at this point.)

15 gal. oil = 141,000 × 15 = 2,1200,000 B.t.u.'s lower available heat value per yard. 15 × 8.25 × 14.2 = 1,760 lbs. air theoretical or 1,884 lbs. products combustion. In order to find the approximate amount of excess air going into the kiln at the firing end, we can set up an equation as follows: let A_e = excess air; then (1,884 + A_e) × (2650 deg. — 50 deg.) × (0.28) = 2,120,000

$$A_e = 1{,}030 \text{ lbs. air}; \frac{1{,}030}{1{,}760}(100)$$

= 58.5 percent excess over theoretical combustion air. Total weight of heating gases is then 1,884 + 1,030 = 2,914 lbs.

Heat required to heat original dry clay to 1450 deg. F. (assumed temperature loss in ignition) 1290 × (1450 — 50) × 0.28 = 506,000 B.t.u.'s.

To heat the calcine to bloating temperature 1200 × (2150 — 1450) 0.28 = 236,000

Basic heat load 742,000 B.t.u./yd.

Assumed radiation loss (7,200 B.t.u./sq. ft. shell/day 100,000

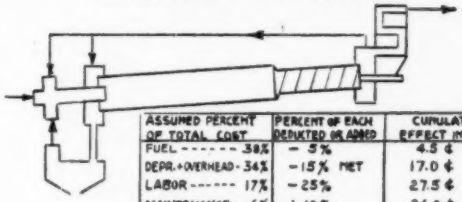
Total 842,000 B.t.u./yd.

Under these conditions, heat content of waste gases = 2,120,000 — 842,000 = 1,278,000 B.t.u's

Exhause temperature (dry shale basis) = $T_e = \frac{1{,}278{,}000}{2{,}914 \times 0.27}$ = 1630 deg. F. (no cold-end air leakage)

FIG.-5

EFFECT OF HIGHER OUTPUT WITH PREHEATER AND SPECIAL FIRING SYSTEM



ASSUMED PERCENT OF TOTAL COST	PERCENT OF EACH DEDUCTED OR ADDED	CUMULATIVE EFFECT IN CENTS
FUEL ------ 38%	- 5%	4.5 ¢ SAVING
DEPR.+OVERHEAD- 34%	-15% NET	17.0 ¢ "
LABOR ------ 17%	-25%	27.5 ¢ "
MAINTENANCE- 6%	+ 10%	26.0 ¢ "
POWER ------ 5%	+ 15%.	24.0¢ NET

BASIS 100% = $ 2.50/YD. 50% INCREASED OUTPUT
SAVING = 9.5% OF TOTAL COST

Computation Basis of Some Heat Savings *Sensible heat in the discharged clinker* can be recovered in a recuperating cooler to an amount between 50 to 70 percent. Using a cooler efficiency of 60 percent, we have:

742 × 0.60 = 45,200 B.t.u.'s

recovered, or $\frac{445{,}000}{141{,}000}$ = 3.16 gal.

This reduction in fuel reduces the amount of heating gases:

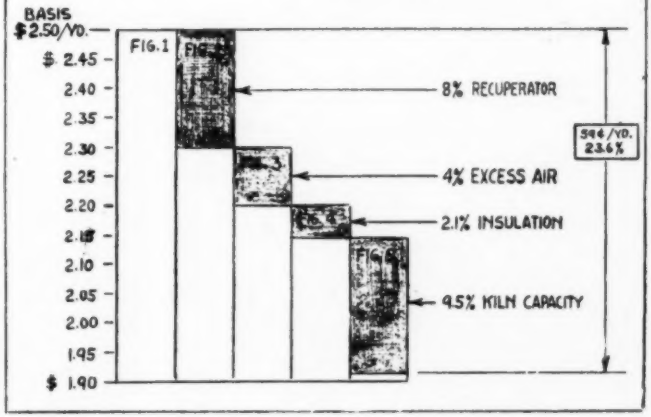
15.000 — 3.16 = 11.84 gal.

11.84 × 8.25 × 14.2 = 1,385 lbs. air, or 1,482 lbs. products of combustion.

1,482 + 1,030 = 2,512 total gases (incl. excess air).

(*Continued on page* 106)

FIG.-6 COMPARISON OF PRACTICAL COST REDUCTIONS THRU APPLIED THERMODYNAMICS



General aerial view of the new sand and gravel plant of Consumers Company at Lacon, Ill. This view, taken shortly after the plant was completed, shows the dredge still in the process of clearing the large basin.

200-Ft. Flume Does Efficient Job Of Sizing And Stockpiling Sands

another ON THE SPOT report

ONE of the best designed and most efficient of the newer sand and gravel operations in the Midwest is the $250,000 plant which Consumers Company operates on the Illinois River near Lacon, Ill., about 25 miles north of Peoria. The plant went into production in June, 1949, and since that time close to 70 percent of its entire output of approximately 150 cu. yd. per hour has been transported by barge to the company's several retail material yards in Chicago.

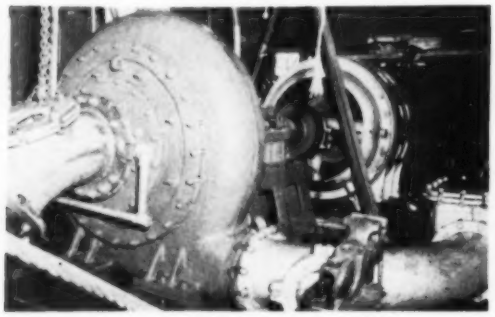
Among the noteworthy features is a sand flume which extends over 200 ft. from the plant proper, effecting not only complete recovery of sands, but an accurate and readily controlled separation of the material into desired sizes. The flume, which is mounted on piers well above grade, also functions as an efficient and economical stockpiling conveyor, providing almost unlimited storage space for sized materials with minimum rehandling.

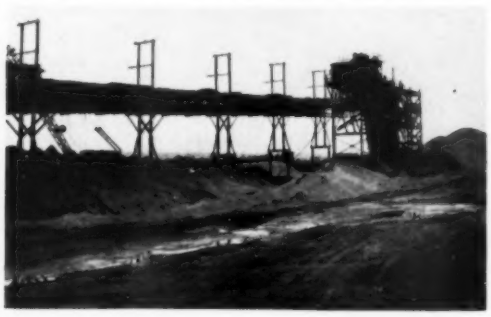
Recovery is by means of rotary cutters and a 12-in. Amsco pump driven by a 300-hp. motor, these units being mounted on a 20- by 40-ft. steel dredge. The cutters can reach to a depth of about 28-ft. below the water surface. Since there is an equal amount of material above the water line, the effective working face over much of the deposit is around 56 ft. in height. Pivoting by means of lateral shore-anchored cables and spuds mounted on its stern, the dredge makes a cut approximately 150 ft. in width.

Although the pump is rated at 140 to 145 cu. yd. per hr., the favorable nature of the deposit and other factors have made it possible to operate a great share of the time at close to 170 cu. yd. per hr. The pump discharges into a 12.1 in. line made up of sections of spiral welded pipe joined by Goodrich dredge sleeves and supported on steel pontoons.

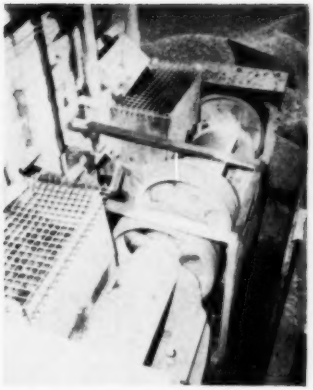
The flow is discharged into a steel hopper at the top of the plant and split over two 4- by 12-ft. triple-deck Telsmith Pulsator screens, driven by separate 10-hp. motors through V belts. Plus 1-in. minus 2½-in. gravel goes by gravity from the screens into a stockpile located directly below, while plus 5/16-in.

Below, left: The 12-in. centrifugal pump is driven by a 300-hp. motor. Below, right: This view of the plant shows a portion of the sand flume, and the crushing and screening tower at right. The faint vertical lines below the flume are streams of sand running into the stockpiles.





One of the two 4- by 12-ft. triple-deck screens at the top of the plant.



The two 10- by 36-in. jaw crushers operate in closed circuit with the vibrating screens.

Bill Learnard, plant superintendent at Consumers' Lacon, Ill., plant.

By WILLIAM M. AVERY

Consumer's New Sand & Gravel Plant On Illinois River Has Capacity of 150 Yds. Per Hr.

minus 1-in. material drops onto a 24-in. by 36-ft. Barber-Greene conveyor which discharges into separate stockpile clear of the plant structure.

Oversize gravel is chuted into bins which feed two 10- by 36-in. Telsmith roller-bearing jaw crushers driven through V belts by 30-hp. motors. The crushers are set at about 1-in. opening, and they are close circuited with the screens by means of a No. 5 Telsmith belt elevator.

The upper decks of both screens are equipped with washing sprays which consist of nozzles located over drilled holes in 1-in. diameter pipes. Wash water is supplied by a 450-g.p.m. pump, and this water and the water from the dredge are joined in the upper end of the sand flume, which extends under the screens.

The flume is 36-in. wide by 269-ft. long, and it is set on a pitch of ¾-in. per ft. The entire length, except for the upper 30 ft., is covered with sections of woven wire screen cloth graduated from relatively small openings at the upper end to coarse mesh at the lower end. Masons' sand is recovered in the first three bays, or approximately 90 ft., and this section is fitted with Harri-Steel "Wabbly Weave" screen cloth to prevent the fine material from plugging the openings. Coarse sand is recovered in the next five bays, or 150-ft., and the last 30-ft. section is used for reclaiming 3/8-in., or seal coat, material.

The various sizes of material flow continuously through 40 spigots located in the bottom of the flume at intervals of about 4 ft. By giving close attention to the adjustment of these valves it is possible to operate indefinitely without any appreciable loss of sand from the end of the flume. If the dredge encounters a strata of very fine sand, the spigots at the upper end of the flume are opened wider to draw off the excess of fine material, whereas the opposite procedure is followed when the dredge is pumping relatively coarse material.

The center line of the plant and of the sand flume is about 60 ft. from a barge basin, created in part by dredging operations, which adjoins the Illinois River. Tow boats drop strings of empty barges in this almost land-locked basin, where they

Below, left: View of the 36-in. by 300-ft. loading conveyor which runs parallel to the sand flume. The conveyor is loaded by means of a 1¼-cu. yd. crane and a hopper which moves on rails. Below, right: View of the 20- by 40-ft. steel dredge from which material is pumped to the plant proper. Pipe line to plant is visible at left.

The 36-in. by 90-ft. shuttle conveyor which discharges into the barges. Frame runs in or out on wheels to locate discharge exactly over the center of any barge regardless of its width.

can be handled by plant personnel using hand-operated winches.

Barges are loaded by means of a traveling hopper, a 36-in. by 300-ft. Barber-Greene loading conveyor, and a 36-in. by 90-ft. Barber-Greene shuttle conveyor which runs at right angles to the loading conveyor. By running the shuttle conveyor in or out from the land it is possible to discharge amidship of any size barge.

The traveling hopper operates on rails and straddles the long loading conveyor. It is spotted at any desired point in the length of the conveyor and charged from the stockpiles by means of a 1¼-cu. yd. Manitowoc Speedcrane powered by a Cummins diesel engine. At the point where the long conveyor discharges on the shuttle the materials receive a final washing with three sets of spray nozzles. In the case of gravel this last-minute clean-up is facilitated by passing the material over a ¼-in. perforated plate located below the sprays. This plate, which has ¼-in. openings, is swung out of the way when sand is being loaded.

One of the outstanding features of the layout of the plant is the tremendous amounts of material of various sizes which can be stockpiled without rehandling. The areas under the sand flume provide for gravity storage of about 8000 cu. yd. of torpedo sand, 1800 cu. yd. of masons' sand, and 600 cu. yd. of seal coat material. About two barge loads, or 1800 cu. yds., of 1-in. gravel can be accommodated in the conveyor-fed stockpile at the end of the plant, and some 600 cu. yd. of 1½-in. material can be stored by gravity in the area directly below the screens. By bulldozing or other means of distribution all of these capacity figures can be increased considerably.

As mentioned earlier, barge shipments account for considerably more than half of the output at Lacon, and of this portion all but a negligible amount goes to retail material yards which Consumers Company operates. The 140-mile run from Lacon to Chicago is made by towboats operated by the Marine Transit Co.

Truck shipments account for perhaps 30 percent of the total business. Trucks are loaded from two sets of Butler bins which are located on the land side of the plant. The bins are charged from stockpiles with a 1-cu. yd. Osgood crane powered by a Caterpillar diesel engine. Stockpiling area on this side of the plant was formerly limited by a high bank which extended almost the full length of the site. This crowding was eliminated by making one cut with the dredge parallel to the plant, and then backfilling this strip with the material in the bank.

Only five men are employed on actual plant operation — two (an engineer and an oiler) on the dredge, and three (an engineer, a flume man, and a laborer) on the plant proper. The shipping crew consists of two crane operators, two barge loaders, and a truck driver for stockpiling operations. The superintendent, a foreman, and one clerk comprise the office force.

The Lacon plant operates about ten months out of the year, shutting down normally only during the most severe winter weather. It is possible to operate during freezing weather by draining the water from the sand flume at the end of the day, but when day-time temperatures go much below 20 deg. F. it is considered best to shut down altogether.

Including the new installation at Lacon, Consumers Company operates nine plants in the Chicago area. Other sand and gravel operations are located at Algonquin, Crystal Lake, and South Beloit, all in Illinois, and at Afton, and Dausman, Wis. Crushed limestone and related materials are produced at plants located at Bellwood and McCook, both in Illinois, and at Ives, Wis.

Officers of the company are Robert C. Reed, president, Otto A. Cheska, vice-president, Robert J. Hummel, vice-president, Harry A. Clark, vice-president, L. M. Bowden, secretary, Edward F. Johnson, treasurer, and Frank E. Zavrel, assistant secretary.

Dust Problem Solved

(*From page 82*)

through them one at a time, thus keeping the filter bags cleaned. Cement removed from the filter bags drops down into a star bin. From 40 to 60 barrels of cement are collected and saved by this operation from each boatload of cement that docks at the Cleveland plant. Inasmuch as the filter bags are cleaned constantly, the suction on the system remains uniform, an important factor when one considers that unloading usually continues for about 12 hours.

The filter installation has been in use for about a year and has effectively eliminated the dust nuisance. Superintendent Frank C. Floreck says that its greatest advantage is continuous operation with no time out for bag shaking. "We could run it a week without stopping," says Mr. Floreck.

Another dust collector is installed on the second floor of the plant, a Northern Blower unit which collects the dust from the bagging operations and takes care of the plant in general. The plant contains four St. Regis valve bag packers for filling paper bags.

Fire destroyed about $10,000 worth of rock crushing and conveying machinery at the plant of the Byer Crushed Rock Company, Jackson County, Mo. The fire was reportedly caused by an electrical storm.

Tennessee Valley Authority Develops Tunnel Blast Technique

By PAUL C. ZIEMKE

another P-Q exclusive

WHILE coyote hole or tunnel blasts are quite old to the hard rock industry, there is always the prospect that some group is going to strive for something quite distinctly different and radical in scope. When the new technique fails to achieve the desired ends, the story is rarely told beyond the confines of the operator's own organization. On the other hand, when plans work out well for the initial experiment, other trials follow until an effective technique is established which others may copy with an assurance that the plan will work. All that is required then is that some slight alterations be made to compensate for local geological conditions common to the new locale.

Ever since the Tennessee Valley Authority has been active in power and storage dam construction in half a dozen Southern states, the hard rock needs of the concrete and fill or rip-rap engineers have always been adequately met by the time-honored wagon and well-drill methods. That was the technique used again as work commenced several years ago on the Watauga Dam on the Tennessee-Virginia boundary, and later at the South Holston Dam in Tennessee. Wagon drills placed the holes for the stripping operations on the quarry sites, and these were followed by well-drills for the extensive production of rock needed for the concrete aggregate.

While the initial core-drilling operations disclosed the fact that the Unicoi formation of the Cambrian stone was unexpectedly hard and abrasive to the degree where drill wear was a serious factor, it was not until big-scale rock production was in order that real consideration was given to the problem. The need for the study was urgent in that the Watauga project, unlike its many concrete and steel pace-setters, was redesigned to use a rock-and-earth fill plan requiring an enormous yardage of broken stone. While the old standby well-drills continued to produce the yardage needed for the concrete in tunnel linings, spillway and powerhouse foundations miners were probing the rock ribs of the mountain to learn how effectively they could penetrate the hard rock with coyote hole tunnels.

Like the prospectors of earlier times, the miners selected a tunnel size just big enough to work in with some degree of efficiency, since initially deep penetration into the mountain was the desired end, and not a tunnel of large cross section and shorter length. Tunnel headings averaged 4 by 6 ft. in section and were developed by drifter-type drills mounted on jack-supported posts. Seven-ft. steel and detachable bits ranging from 2½ to 1⅛ in. in sets of three lengths were used. The miners did not confine their efforts to one heading but loaded and blasted each cut and set up in the next adit having its mucking cycle completed. By this means as many as 15 headings were in progress at one time, with a daily average of 25 rounds completed in one day. Mucking for the adits was achieved by scrapers hauled by electrically-powered, two-drum hoists located at the portal. The muck in the crosscuts was transported by wheel-barrow to an adit where the scraper moved it out with the regular muck. Where overbreaks occurred in the twisted and contorted trap rock, considerable muck was piled in overbreak spaces to save mucking expense and to reduce powder cavity cross sections.

Carbide-tipped detachable bits proved their worth in the quartzite rock, which has the geological characteristics of being unduly abrasive, hard, and badly contorted from ancient volcanic upheavals — vicious conditions known to miners in hard trap rock. In so far as possible, the tunnel layout took into consideration

● Scene at the Watauga Dam's main quarry, looking upstream. At this time clearing was in progress.

tightness and thickness of bedding, jointing, direction of dip, and amount of weathering, plus the condition of the rock farther back in the mountain proper where the bulk of the powder charge was to be located.

Cost figures for coyote hole blasts were computed as follows:

Average advance per heading per day, 55 ft.

Explosives per foot of gallery, 330 lb. (average)

Explosives per cu. yd. of solid rock, 1.45 lb.

Explosives per cu. yd. of loose rock, .75 lb.

Cost of cu. yd. ready for loading into trucks, $0.396

Total cost of rock in place, cu. yd., $0.969.

The required volume of explosives was arrived at by computing the volume of rock above each crosscut. This varied from about 1 lb. per cu. yd. of solid rock over the outside tunnels to about 2 lb. over the inside tunnels. These computations were made by the du Pont representatives. As might be expected, no fixed rules prevailed in establishing the loading factors because of the many variables encountered. Great weight was placed on the judgment of the quarry superintendent, with his background of experience in the well-drill operations, plus that of the two consultants who remained on the project throughout its coyote tunnel program.

Several "firsts" were achieved with the Nitramon brand of explosives securely encased in tough tin cans. Electric lights were used, a practice once considered suicidal in the day of ordinary dynamite and certainly outlawed by every safety engineer wherever electrical detonation is employed. Men handling the cans did not complain of throbbing toxic headaches, and there were blasting operations going on in the next adit while the first was being loaded. The distance? 40 to 50 ft.

The powder men were spared much hard labor by the use of a heavy steel-runnered sled which was hauled in over the rough, rock-strewn floor by the scraper hoist also used for mucking operations. While runners squeaked and threw sparks from contact with the carborundum-like rock, the men placed the Nitramon, like lumberjacks loading pulpwood in gondola freight cars. Air was forced into the tunnel extremities through flexible Ventitube, lengths of which were brought out as the loading progressed, as was also the tail "rope" sheave.

Two lines of the new nylon-covered detonation fuse, Primacord, were run from breast to portal in each adit, with connecting links threaded through the terminal crosscuts. Two were used on the theory that with cross-connections at 25-ft. intervals 100 percent detonation would still be achieved, should one line inadvertently be broken between cross-ties. Several methods of mechanical protection were used in the laying of the Primacord lines. Sand was used to cushion the fuse on the tunnel floor in some instances; in others burlap bagging was used to wrap them; and in the remaining runs where rough rock covered the floor, the lines were carried along above the stacked explosive. Because of the peculiarly insensitive nature of the Nitramon,

Coyote Tunnel Blast Data

		Watauga Dam			South Holston Dam		
		Blast No. 1	Blast No. 2	Blast No. 3	Blast No. 1	Blast No. 2	Blast No. 3
Adits Driven	No.	3	8	5	5	3	2
Total Length Adits	l.f.	465	1,025	653	1,109	1,177	720
Total Length Galleries	l.f.	1,093	1,610	1,379	2,974	4,077	1,306
Total Length Tunnel	l.f.	1,558	2,635	2,032	3,993	5,254	2,026
Working Time to Drive	Days	40	51	67	54	106	34
Average Advance per Day	l.f.	39	52	30	74	50	60
Quarry Volume Over Tunnels	c.y.	271,500	355,700	242,800	512,758	931,935	269,100
Estimated Quarry Yield	c.y.	600,000	800,000	600,000	925,000	1,800,000	560,000
Solid Rock per Ft. of Gallery	c.y.	248.4	208.5	176.1	172.4	228.6	206
Total Explosive	lbs.	316,486	526,925	422,563	844,503	1,362,095	501,102
Primers Used	No.	131	199	173	378	436	164
Explosive per Ft. of Gallery	lbs.	289.6	327.3	306.4	283.8	334.3	384
Explosive per Cu Yd Solid Rock	lbs.	1.17	1.57	1.74	1.64	1.45	1.86
Explosive per Cu Yd Loose Rock	lbs.	0.53	0.66	0.70	0.91	0.70	0.90
Blasting Date		9-11-47	11-8-47	3-11-48	7-14-48	2-5-49	4-16-49

● This shot, made nine months later near the point from which preceding picture was taken, shows rock removed in the interval.

each stack was provided with a booster can laid immediately adjacent to the Primacord.

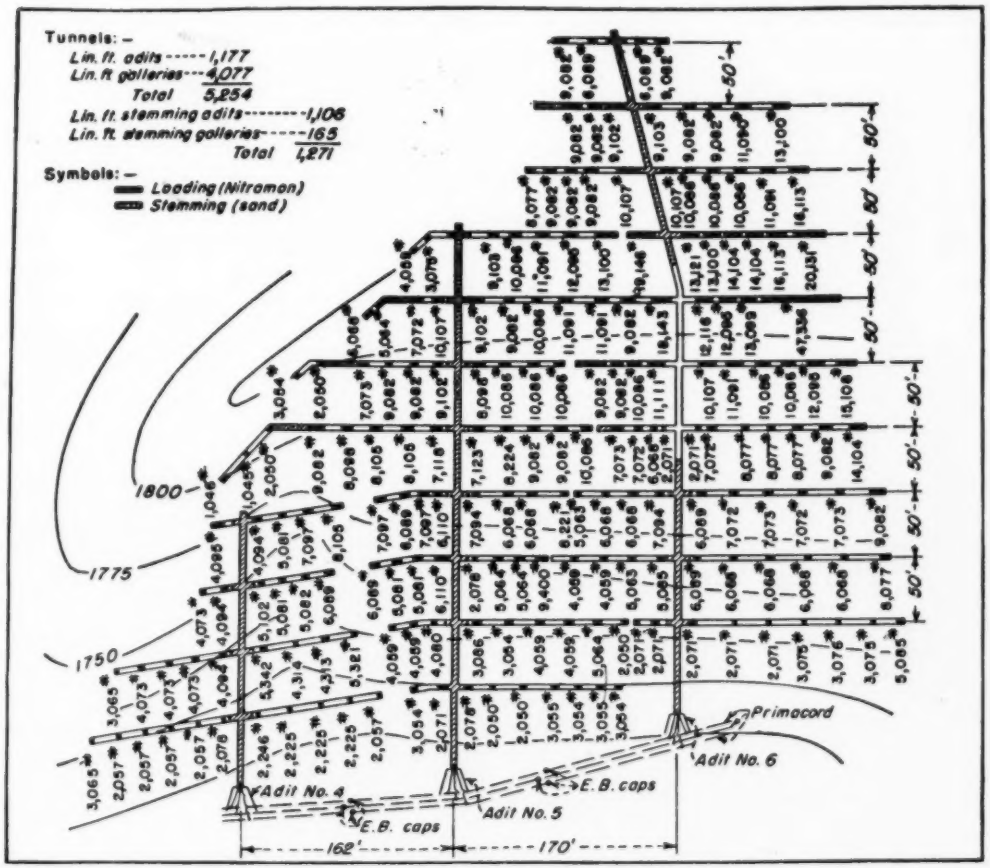
These primers weighed 20.6 lb. per can, while the general charge used cans weighing from 24.5 to 33 lb. each. The type of explosive and the quantity used per stack, plus the spaces between stacks, were determined by the nature of the tunnel rock.

Initially the tunnel extremities were sealed by hand-placed sand bags. Normally no tamping was used in the crosscuts except in those instances where the burden was deemed so light as to require additional confinement through tamping. Later sand was placed very effectively by a blower which cut time and labor to the minimum. This method probably placed the sand more compactly than the bag method, since all the crevices were sealed airtight for the full distance of the plug—at least, still shots and motion pictures would indicate that outbursts of expanding gases occurred through rock fissures in the ballooning mountain face before the plugs gave way.

Double Primacord buses were laid to intersect each adit. Near each portal and at other vital points, two No. 6 electric blasting caps were taped to the bus circuit. The leg wires of these were coupled in series to make final connection to a No. 6 gauge insulated copper wire circuit extending some 3,000 ft. to the locked, 220-volt firing switch. This switch was in series with a second unit located at the power source. At blasting time, as electric caps were brought on the premises, all power for a ½-mile radius was cut off, lest ground currents trigger a premature explosion.

The magnitude of the Watauga blasts and those that followed at the South Holston earth-filled dam project some time later offered rare opportunities for scientists from the U. S. Coast Guard and Geodetic Survey, National Research Bureau, War Department, Massachusetts Institute of Technology, and the Carnegie Institute of Washington to measure the distance and rate of travel of the tremor through the earth's crust. Effects of the larger blasts were recorded on seismographs as far distant as St. Louis, Mo., and Ottawa, Canada. The timing was done by the Carnegie Institute of Washington, with time signals from the Bureau of Standards.

The detonation of 526,925 lb. of Nitramon on the Watauga project was witnessed by the author under ideal conditions. The low fall temperature aided in that the great volume of hot gases escaping through the rock crevices instantly turned to steam to highlight the supernatural power of the great explosion. Mingled with the steam and dust jets were visions of a true Dante's Inferno, as multicolored flames shot



• The loading plan for what is said to be the largest tunnel blast ever made. All tunnels are on one level. This load of explosives —1,363,000 lb.—was fired at the South Holston Dam.

forth with incredible speed and violence. A night-time blast of such proportions would certainly present a memorable spectacle.

While the vibration and shock wave were distinctly noticeable to all, these were not at all in the proportions one would associate with such a heavy charge. Many among those who viewed the blast, muffed an opportunity to achieve an epic camera shot when they delayed seconds too long in closing the shutter. Either the heavy earth tremors caused ruinous blurring of the image, or the camera's lense caught nothing more than the view of the towering cloud of stone dust and smoke.

Certainly one of the most spectacular manifestations of the big shot was the audible and long-sustained rumble of the falling mountain side. This can be readily understood when one realizes that some 800,000 cu. yd. of rock had been torn from the quarry face to move upward, outward, and down in a giant, man-made cascade of moving rock.

The Authority's experiment with tunnel blasts has proven most successful in the large-scale production of cheap rock where geological conditions lend themselves to such developments under the guidance of skilled technicians. One can hardly argue with the statement that three big shots placed 3,285,000 cu. yd. on the quarry floor for an average 29 cents per yard. Adding the additional costs of quarry scaling, stripping, and some secondary blasting, the cost is still only 40 cents per cu. yd.

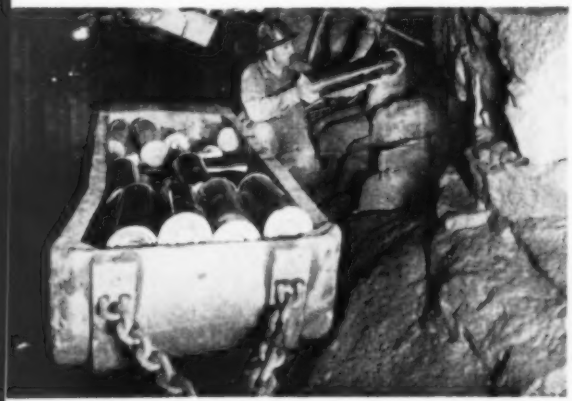
Ideal geological conditions such as steeply-inclined mountain sides, or solid rock hills that can be broken up in a single shot, produce an exceptionally high yield of rock, since the overbreak is always of sufficient proportions up the face to augment the already bounteous yield. The natural swell of rock may be estimated conservatively at 50 percent, and assuming a fair overbreak, it is quite accurate to state that the total of stone broken will be double the yardage above the tunnels.

(*Cont. on p. 102*)

• A coyote hole for the blast at Spillway Plaza.

• Above: Each line of Primacord is wrapped individually. Note the cross folding of the hard, adhesive volcanic rock.

• Below, right: View of a cross tunnel in South Holston Dam quarry No. 4, showing Nitramon being stacked in place.



• Below: Loading at a cross-cut. The vehicle is a "go devil" sled.

More Information, Please

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1. Colprovia Paving Processes for Non-Skid, Cold Laid Pavements. The sixteen pages of this well illustrated booklet tell the story of the several types of pavement made with Colprovia materials. Roads, airport runways, tennis courts, plazas, drives, floors, and sidewalks are pictured and the processes described. Tables and other useful information about the application of the various products are included. Colprovia Roads.

2. Hays Combustion and Industrial Instruments and Control. Pub. No. 687. A condensed catalog that illustrates and lists many of the instruments and control devices made by the company. While outlining the types of instruments available this bulletin lists the more comprehensive publications that the company has on specific applications and types of measuring and control devices. The Hays Corporation.

3. Blue Book of Packaging. A profusely illustrated booklet that pictures several models of steel strapping machines and shows photos of the varied applications of each. Uses of steel strapping on carloads of steel products to boxes of flowers are shown. Whenever products must be shipped in packages or on pallets there is an opportunity to improve packaging to reduce losses. This booklet points out many interesting uses for steel strapping in ways that are seldom encountered. Gerrard Steel Strapping Company.

4. Buda 2,000 lb. Fork Lift Trucks. Bulletin No. 1544. A three-page folder that shows the major features of the fork lift truck made by the company. Some of the uses are pictured and specification tables included. A useful folder for buyers of lift trucks and materials handling equipment. The Buda Company.

5. Punch-Lok Hose Clamps, Tools and Fittings. Catalog No. 300. A 12 page catalog on hose clamps, tools, and fittings that describes and illustrates the Punch-Lok method of making hose connections, and other small banding operations. Clamps in a wide range of sizes and of several different metals are listed. Many handy uses around hose lines, wire rope, and cables are shown. Punch-Lok Company.

6. Don't Get Caught with Your Plants Down. Equipment Bulletin SMD-1. A self-mailing folder that features aggregate crushing, screening and washing equipment. The bulletin covers basic production units, portable and stationary crushing plants and portable primary crushing plants. This is intended to present an overall picture of the lines of products made by the company. Detailed specifications on the machines are not included in this folder, although the number of sizes and the range is given. Diamond Iron Works.

7. Barber-Greene Bucket Loader Model 522. Bulletin BL522. Pictures tell virtually the whole story in this eight page bulletin that shows the swivel spout and conveyor types of the Model 522 bucket loader. Two pages show close-ups of the important features of the machine, other pages show the machines and the typical applications of them. A specification sheet is inclosed separately. Barber-Greene Company.

8. Preco Back-Rip Scarifiers. Form No. P551. Here are hinged teeth for bulldozers which rip when backing up. This folder describes and pictures the use of the back-rip scarifier teeth which are mounted on the back of a bulldozer blade. The hinged teeth rip the soil or other compacted material in the same way as a ripper but operate on the back movement of the dozer to save time and utilize waste motion. A hinged feature enables the dozer to operate forward without any ripping action. The teeth are easily retracted when not needed. These teeth add materially to the effectiveness of bulldozers in stripping, grading, digging and other earthmoving operations and in preparing the material for scraper loading. Separate specification sheets are available according to size of dozer. Preco Inc.

9. Put a Team of Champs on Your Job With an International TD-24 Fleet. CR-107-A. An eight page self mailing bulletin that is a collection of photos showing some of the larger and more difficult applications that the TD-24 crawler tractor has overcome. International Harvester Company.

10. National Security Rides on Trucks. An eight page booklet that presents facts, figures, and quotations from authoritative sources on the necessity and value of trucks to the American industrial system in peace and war. This is designed to be a concise collection of information for use in combating anti-truck agitation. Trucking Information Service, Mack Trucks.

11. K-P Spiral Woven Wire Conveyor Belts and Complete Conveying Systems. Catalog No. 31. Forty pages of illustrations of standard and special types of wire belting weaves with specifications and detailed descriptions. Power formulae and construction details are fully covered as well as suggestions for maintenance. A useful handbook on spiral woven wire conveyor belts and conveyor systems. Korb-Pettit Wire Fabrics and Iron Works.

12. U. S. Electrical Wires and Cables for the Mining Industry. Form W-51-5. A six page folder that uses a drawing of a mine layout to highlight places where electric wire and cable is used. A list gives all the types of cable available while enlarged views show the construction of each major type. One page lists the tests that are made to insure that the quality of the cable is up to standard. United States Rubber Company.

13. How to Step Up Tractor Shovel Production, Reduce Tractor Shovel Maintenance. Bulletin LO200. This eight page bulletin describes the Lodover overhead and front-end shovel for use on T-9 and TD-9 International tractors. Diagrams, drawings and photos show the operation

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of the Lodover attachment in digging, carrying and dumping without turning the tractor. Other attachments—bull-dozer blades, cab, lift fork, boom, and track bucket are shown. Specifications of the Lodover attachment and the T-9 and TD-9 tractors are given. Service Supply Corporation.

14. Engineering Standards, Multiple V-Belt Drives. Sixteen pages of the latest engineering opinion and research on the use of V-Belt drives. The proper sheaves and belts to be used for the attainment of optimum efficiency and economy are given for the particular duty required. The manual has been developed by the technical committees of the Multiple V-Belt Drive Association, 7 W. Madison Street, Chicago 2, Ill. and the Rubber Manufacturers Association, 444 Madison Avenue, New York 22, N. Y. Copies may be obtained from either association at a price of $1.00 for 2 copies.

15. Prefabricated Package Plants. A flow sheet and text present the operation of prefabricated sink-float plant for the heavy media separation of minerals. The booklet describes the packaged plant which may be used in places that do not require large installations or where the ore supply is such that relocation of the plant may be desirable after a period of operation. The Sink and Float process of separation is explained and most of the questions concerning operation of the plant are answered. The Sink and Float Corporation.

16. Catalog and Parts List, Model "C" Hydraulic Pipe Machine. Thirty-six pages describe the various methods of making pipe, point out uses, give the history of the Model "C" and show all the steps in setting up the machine, operating it, and repairing it. Pages of photos, and drawings show all parts by assemblies and name them. Text is clear and covers all points that normally arise in the use of the machines or the making of pipe. Houston Concrete Machinery Company.

17. Faster Drilling at Less Cost With the DBT Throwaway Bits. This six-page folder presents the one pass bits that are designed to be used once and discarded. The bits are heat treated for hardness and are used on round end drill rods. No threads or locks are used. Once the drill rod ends have been prepared it is a simple matter to place a bit or to remove it. Sizes are available for ⅜, 1, and 1¼ in. sockets with bit sizes from 1¼ to 2¾ in. Drill Bit and Tool Company.

18. Valor Construction Equipment. Durable, Economical, Dependable. A folder that portrays the Valor masonry saw which features a portable table mounting or a permanent one. Blades may be changed for wet or dry cutting, or for diamond edge. Concrete block, brick, sewer pipe and tile are some of the items that are handled by the machine. A line of wet, dry, and diamond blades are listed in different sizes and abors to fit all masonry saws. Victor Engineering Corp.

19. Standard Asphalt Plants. Bulletins 511 & 150. The first bulletin is in the nature of an introduction, testimonials and pictures of installations are given. Some of the main features are shown and described. The second bulletin goes into detail on the Series SM plants and shows the various components. The plants are designed for one-man operation. Standard Steel Corporation.

20. Commercial Hydraulic Cylinders. Catalog H-3. Sixty pages of drawings and specifications. Details of construction and application photos are presented in addition to the strictly engineering data that makes up most of the book. Single acting, double acting, telescopic and special types of hydraulic cylinders are shown for practically any use up to 1,500 p.s.i. In addition to the cylinders there are general listings of pumps, motors, valves and other accessories for use in hydraulic systems. The Commercial Shearing and Stamping Company.

21. 22-Ton Model TD Rear-Dump Euclid. Form No. 121. A well illustrated bulletin that shows applications and mechanical features of the Euclid rear-dump truck. This series has a spring-mounted drive axle for smoother operation. Specifications are given for the two types which have a payload of 22 tons, or 14.8 cu. yd. struck capacity. Euclid Road Machinery Company.

22. Naylor Low-Pressure Wedge-Lock Coupling Designed for Naylor Light-Weight Pipe. Bulletin No. 514. This folder illustrates a light duty wedging type coupling for ventilating pipe and other low pressure uses. Dimensions and suggested applications are included. Naylor Pipe Company.

23. Precision Speed Control With the E-M Adjustable-Speed Magnetic Drive. Publication 1107. This 32 page book is technical in scope, and contains complete information both on the magnetic drive and the new magnetic amplifier Regutron speed control. The technical information is clarified through the use of charts, diagrams and illustrations. An illustrated section is included which covers the application of the drive and the Regutron control in industry. Electric Machinery Manufacturing Company.

24. American Electric Car Pullers. Catalog 100h-66. This eight page booklet describes the three types of car pullers made by the company—the capstan type, the drum type, and the continuous rope type. In addition to giving specifications on the three types, various applications are suggested such as car spotting, barge warping, mine car hauling, machinery skidding, etc. One man operation is featured. American Hoist and Derrick Company.

25. Clyde Steel Derricks. Bulletin L-9. Sixteen pages on the five kinds of derricks made by the company—stiff-leg, guy, steel erectors, barge, and special. Specifications for the stationary derricks are given while those for marine and special applications are varied to individual conditions. Features of the several types are illustrated and described. Clyde Iron Works.

26. 50 years of Progress, 1901-1951. The golden anniversary edition of the Louis Allis Messenger. A 48 page book that gives the history of the company, illustrates the development of the electric motors that it makes, and supplies much historical information on methods, products, and industrial developments generally. An excellent publication for those interested in the electric motor industry industrially or historically. The Louis Allis Company.

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Twenty-Five Years of Cement Making

A history of the Calaveras Cement Company and its 1951 plant expansion program

By HARRY F. UTLEY

another ON THE SPOT report

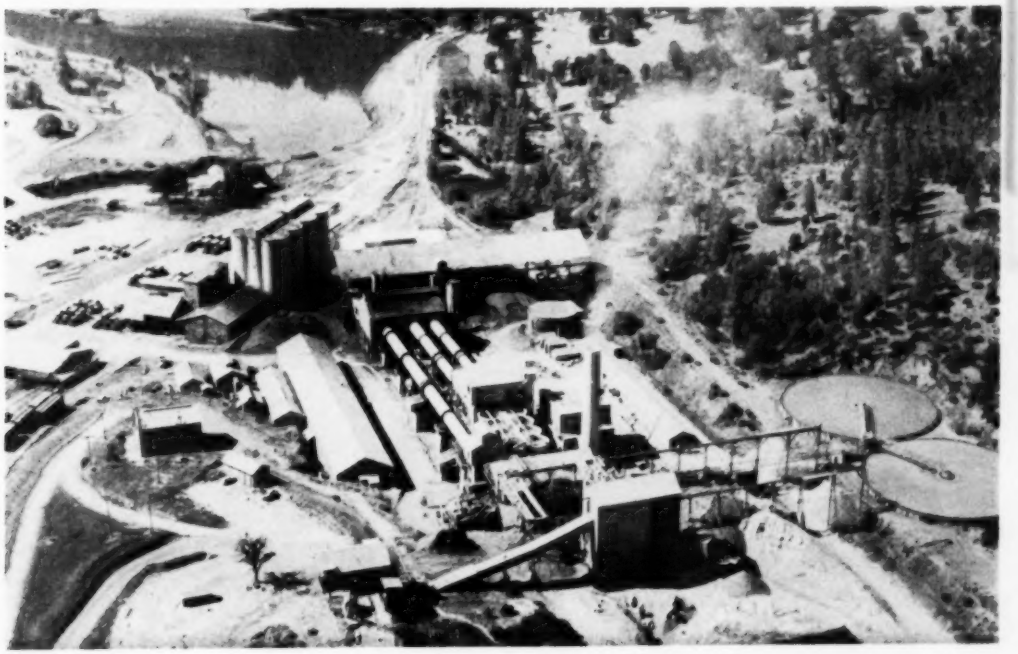
THE Calaveras Cement Company is this year observing its 25th anniversary. It was on May 9, 1926, that the company's modern, 2-kiln wet-process cement plant near San Andreas, Calif., was formally opened, with production following soon thereafter. The formal opening was a great day, marked by a tremendous open house and barbecue in the true tradition of the Golden West that attracted 15,000 guests. It still holds the record as the largest gathering ever held in Calaveras County!

The Calaveras plant is located in the heart of the Mother Lode country, which teemed with prospectors and gold miners in the roaring days of 1849. Today, the cement rock quarried by Calaveras has displaced the yellow metal as the Mother Lode's most important mineral. A son of one of the gold-rush pioneers, William W. Mein, was destined to be the founder of the Calaveras company.

Although the cement plant was spanking new and the last word in modern design when it was built a quarter-century ago, it has, nonetheless, continued to be improved year after year as newer equipment and advanced processing techniques were developed within the industry. The year 1951 is no exception, since the company is observing its silver anniversary and embarking upon another expansion program to increase efficiency and capacity and to facilitate shipments.

It was quite by coincidence that Mr. Mein first became interested in the limestone deposit near San Andreas, setting in motion the chain of events leading to the formation of the Calaveras Cement Co. Had he and William Macnider not occupied adjoining offices in San Francisco, the two men might never have met. And had Mr. Mein's telephone not been out of order on December 15, 1922, necessitating the use of the Macnider instrument next door, Mr. Mein might not have seen the array of limestone samples on Mr. Macnider's desk. Mr. Mein was no stranger to limestone. Years before, in South Africa, he had quarried it for the burning of lime. The proposal to operate a cement plant on the deposit intrigued him, for he anticipated a heavy demand for the commodity.

Analysis of over 400 samples and determination of the tonnage proved to Mr. Mein's satisfaction that the deposits were ideal for the manufacture of portland cement. The soundness of the project made it possible in a short time to raise the $2,000,000 needed to launch the company. Organization was completed, with Mr. Mein as president, and an agreement was made with the Southern Pacific Railroad to bring a branch line to the plant site. Ground was broken



• An aerial view of the Calaveras Cement Company's plant at San Andreas, Calif. Four more silos have just been added to the eight shown. The fourth kiln will be installed beside the 360-ft. unit shown at the left.

May 1, 1925, but construction proceeded slowly. The heavy machinery could not be brought in until the rail line was completed. The last trackage was laid on Christmas Eve, 1925, and late that night the first trainload of equipment reached the plant. After that, work progressed rapidly. Meanwhile, Louis J. Brunel (a member of the board of directors for the last 18 years) was appointed quarry superintendent, and H. A. Henry left his career as a cement-mill specialist with Allis-Chalmers to become the first plant superintendent.

On June 14, 1926, the first trainload of cement was shipped, the six cars comprising the train being consigned to as many building-supply dealers in northern California. Except for two firms now out of business, these original customers are still on the company's list of active accounts. A year later the company obtained the order to furnish the cement for the building of Pardee Dam. This large order firmly established for Calaveras a reputation for dependability of supply. Capacity production had meanwhile emphasized certain inadequacies in the physical plant. The worst bottleneck was corrected by doubling the finished cement storage capacity. Facilities for the storage of crushed rock and clinker were also expanded.

Early in 1929 the company increased its limestone reserves by purchasing 1,400 additional acres, with deposits sufficient to yield an estimated 250,000,000 bbl. of cement—enough to keep the plant operating for 100 years at the present rate of production.

The depression years cut production to one-third of its capacity. In one dismal month, February, 1932, shipments were less than 18,000 bbl., a total which was nearly achieved in one day recently. President Mein cut costs and selling prices to the bone and was rewarded with orders for furnishing some of the cement for the San Francisco-Oakland Bay Bridge, which tided the plant over through the years 1933-1934. At the same time, the company began manufacturing white portland cement, the only producing plant turning out this specialty in the West. In 1936 another specialty, a portland-puzzolan product was placed on the market.

Despite the bleak outlook in the depression years, the company continued to utilize a portion of its accumulated reserves for plant improvements designed primarily to reduce production costs. Plant improvements in the late 'thirties included the installation of Cottrell electrical precipitators for the recovery of flue dust, a new compeb mill on the finish-grinding side, and the addition of a chain system in the kilns to lower fuel costs. The net result of the increased grinding capacity and other improvements was an increase in rated capacity of 25 percent.

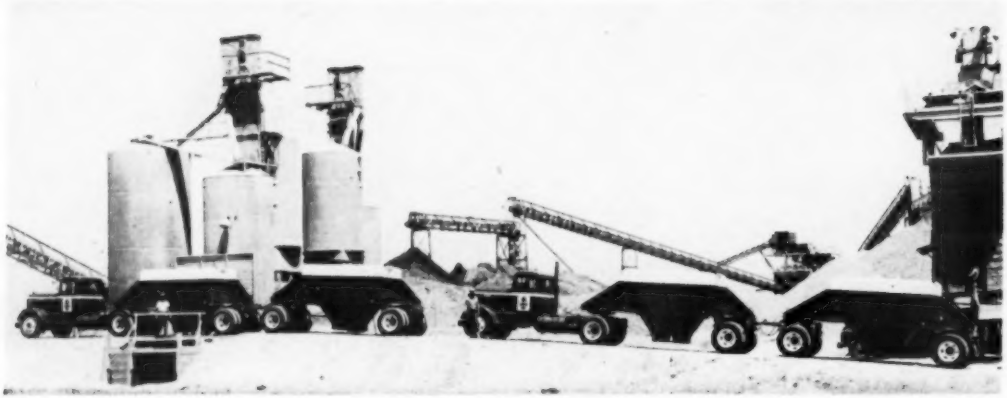
After Pearl Harbor, demands of the armed forces and a contract to supply 800,000 bbl. of cement for Friant Dam zoomed production to a new high of 1,339,000 bbl. in a single year, a record that was not again attained until the post-war boom year of 1947.

Meanwhile, anticipating the coming demand, Calaveras in 1940 had embarked upon a $1,000,000 improvement program which began with the laying of a 40-mile pipeline

• William Wallace Mein Jr., who was recently elevated to the presidency of Calaveras.

• William Wallace Mein Sr., founder of Calaveras 25 years ago, remains active as chairman of the board.

• These two dual trailers, which belong to an extensive fleet, are here delivering bulk cement to the silos at the Delta-Mendota Irrigation Canal batching plant.



to bring natural gas to the plant to fuel the kilns. Added productive capacity was also needed, but the obvious step, adding a third kiln, had to be postponed because of the critical material situation and the long time required for fabrication and erection. A partial solution was found in the installation of a closed-circuit grinding system, along with two new classifiers and thickeners. The trend from rail to truck transportation, given added impetus during the war years, caused the company to launch the beginnings of its present large fleet of bulk-delivery units.

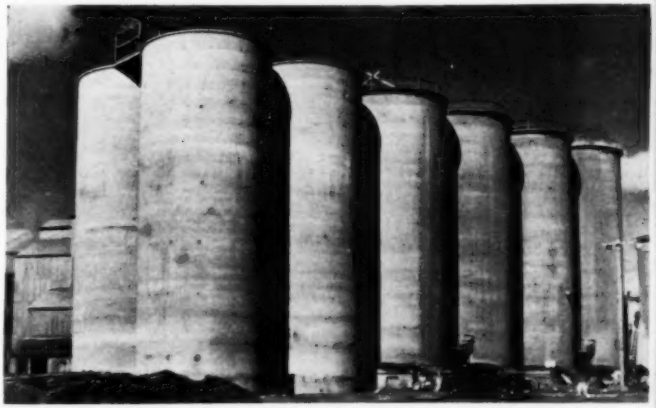
Before the end of World War II President Mein mapped another program for enlarging production facilities, which was launched in 1945. Since that year, the company has invested nearly $3,000,000 for expansion. A third kiln, 11 ft. 3 in. in diameter and 360 ft. long, was purchased from the Defense Plant Corporation after brief use at Henderson, Nev., by the Manganese Ore Co. This unit, the largest of the Calaveras kilns, was dedicated in 1946. The company celebrated the event with another big open-air barbecue. With the new kiln in service, burning capacity was nearly doubled.

Before the added kiln potential could be fully realized, however, other additions to the plant were necessary. These included another Bucyrus-Erie 120B electric shovel in the quarry and 10 new trucks to deliver stone from quarry to plant, a distance of 5½ mi. These units included Euclid 25-ton end-dump trucks, as well as 35-ton side-dumping trailers. Two old gyratories were replaced by three Telsmith 48-in. secondary crushers which reduce the rock to a top size of ¾ in. A 10-ton P & H crane was also erected to facilitate handling of the stone from storage to the raw end, and both raw- and finish-grinding capacities were increased. The latest type Fuller cooler was installed on the third kiln, as well as another Cottrell electrical precipitator. To speed shipments, 13 new truck-trailer units went into service.

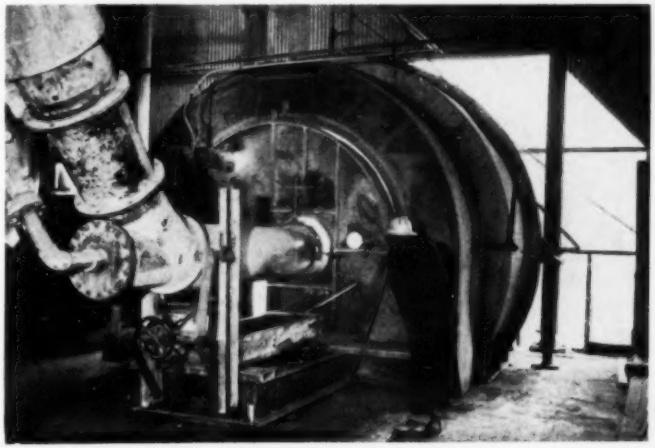
With these improvements and additions completed, Calaveras is embarking upon its second quarter-century of existence with still another great program of expansion. The 1951 schedule which will cost an estimated $2,235,106, and which will boost annual output 3,750,000 bbl., embraces the following:

1. The major item—a fourth ro-

• This view shows the stack and present electrical-precipitator house, soon to be enlarged.



• Finished-cement storage capacity was increased 50 percent early this year by constructing the four silos at the left, making 12 in all.



• The firing end of the 11-ft. 3-in. by 360-ft. kiln. The fourth kiln will be an exact duplicate of this burning unit.

tary kiln. Presently being built by Allis-Chalmers, the new kiln will be the exact duplicate in size of the third kiln, 11 ft. 3 in. by 360 ft. and will be erected alongside it. Completion of the installation is not expected until some time in 1952, however.

2. A new Fuller cooler and another Cottrell precipitator unit to handle clinker and flue dust from kiln No. 4.

3. Two new raw mills, a Marcy 9- by 9-ft. ball-mill and a Marcy 9- by 23-ft. tube-mill. (An existing 8- by 26-ft. tube-mill is being transferred from the raw to the finish end.)

4. Four new 1,000-bbl. slurry silos, bringing total capacity to 12,000 bbl.

5. Four 15,000-bbl. finished-cement storage silos added to the 8 previously in service. These have just been completed, having been erected under contract by the Rust Engineering Co. in a record-breaking 7¼ days. The contractor used sliding-form construction, utilizing 72 workmen on a 24-hr.-day, 'round-the-clock pouring schedule. The structures are 92 ft. high and 33 ft. in diameter.

Still at the helm, Mr. Mein continues active in the direction of the affairs of the company as chairman of the board. William Wallace Mein Jr., second of his four sons, joined the concern in 1933 after his graduation from Harvard. He learned the cement business from the ground up, in quarry, mill, and sales territories. Intimately familiar with all phases of manufacture, marketing, and finance, he was advanced to the post of vice-president eight years later. In 1948 he became assistant to the president and in April, 1951, he was elevated to the presidency.

A. A. Hoffman, consulting engineer, is in active charge of the 1951 improvement program. Lewis A. Parsons is assistant consulting engineer. The plant manager is E. M. Barker, who is capably assisted by Marion S. Heard.

Today there are about 400 loyal employees, and the company is justly proud that, through the years, there has never been a single work stoppage at the plant due to a labor dispute. The few differences that have arisen have been ironed out quickly and amicably in an atmosphere of fairness and mutual respect on all sides. Employees participate in group life insurance, the major portion of the premium being paid by the company. Every new baby in the family of an employee gets a cash gift from the company of $75!

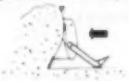
PRECO
Back-Rippers

Daley Corporation, San Diego Contractors, use Preco Back Rippers on their Caterpillar Diesel Tractors for stripping and all around ripping. Bob Caldwell, in charge of their job at the Miramar Air Base is shown with the equipment.

WORK THE DEADHEAD TIME

These four hinged teeth dig in and rip only when the tractor backs up. They make blading easier and faster because they rip out rocks, roots and hard ground, enabling the tractor to work a *full blade* with *less horsepower* on its next trip.

The 4 shanks, capped with lock-on teeth, rip the ground when tractor backs up. Blade acts as depth gage.



When tractor moves forward, teeth drag on top of ground. No controls are required.

Each tooth can be independently pinned up out of way. This permits making side cuts, trenches, and rooting—with one tooth or any other combination.

Like contractors all over America, you can save time and money by using Preco Back Rippers in building pioneer roads, clearing land and rights-of-way, in gravel pit operations, slate breaking in coal strip mines, for logging operations and mounted on pusher tractors for faster scraper loading.

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T.V.A.'s Blast Technique

(*From page 96*)

As stated in the preface of this article, well-drills ushered in the drilling program at Watauga, and while tunnel blasts were resorted to for the production of rip-rap for the dam, aggregate stone continued to be furnished by well-drill shots.

The production of aggregate on this project consisted of 92,000 tons of coarse filter, 143,000 tons of fine filter, 67,000 tons of coarse concrete aggregate, together with 56,000 tons of sand. The local quartzite of a hardness of 7 on the Moh scale required much drill bit sharpening activity, but the concrete men did not suffer for lack of stone. The well-drills used consisted of four 9-in.-bit, crawler-type Bucyrus-Erie drills and two 7-in.-bit Star drills. The primary crushers used consisted of one Telsmith 30-in. by 42-in. jaw crusher and one Telsmith 16B gyratory crusher. The secondary crushers consisted of one Symons 3-ft. standard cone crusher, one Telsmith Gyrasphere Model 36 and one Telsmith 40-in. by 22-in. roll crusher. The concrete mixers used consisted of six 2-cu. yd. Jaeger, and two 2-cu. yd. Rex mixers, all truck-mounted.

Ultrasonic Inspection of Quarry Equipment

By JOHN C. SMACK
Sperry Products, Inc.,
Danbury, Conn.

another P-Q exclusive

THE unexpected breakdown of quarry equipment has long been a costly and unpredictable expense. Examination of shafts and other parts for fatigue cracks has usually required disassembling and a thorough cleaning of the part to be inspected. This is an expensive and time-consuming procedure which usually limits inspection to overhaul periods.

The New York Trap Rock Corporation, operating three large quarries in the Hudson River valley area, has been the first in their industry to investigate fully and apply ultrasonic testing of their heavy equipment in order to eliminate these costly breakdowns.

This newest of the non-destructive methods of testing has been applied extensively during the last six years in industry to the testing of ferrous and non-ferrous materials. Hundreds of metal mills, forge shops, and fabricating plants using the Reflectoscope developed by Sperry Products, Inc., are testing their steel, aluminum, magnesium, and brass products for possible internal defects. Numerous railroads, large and small, are inspecting axles and crankpins for fatigue cracks. High-speed factory equipment, including punch press shafts, are also inspected in place.

In order to ultrasonically test material with the Sperry Reflectoscope, a mounted quartz crystal is applied to the surface of the piece to be inspected. This crystal, vibrating at ultrasonic frequencies (.5, 1.0, 2.25, or 5 million cycles per second), transmits into the material a pulsed beam of vibrations that travel through the piece and is reflected back from discontinuities and from the other side, (Figure 1). Those vibrations that are reflected back to the surface are detected by the crystal, which is now acting as a receiver, and electrical impulses are sent to the screen of a cathode ray tube where they appear on a calibrated line as "pips". The actual distance from the surface of any discontinuity reflecting any part of the vibration pulse can be easily determined from the calibrated scanning line that is adjustable for testing up to thickness of 30 ft. in steel. Reflections from known discontinuities such as oil holes, shoulders and key ways can be easily identified by checking off their known distance from the testing surface.

The Reflectoscope, as can be seen from the illustrations, is a portable unit easily transported to almost any point accessible to the inspection engineer. Operation is on 115-volt, 60-cycle a.c., and in the field a portable 250-watt gasoline-

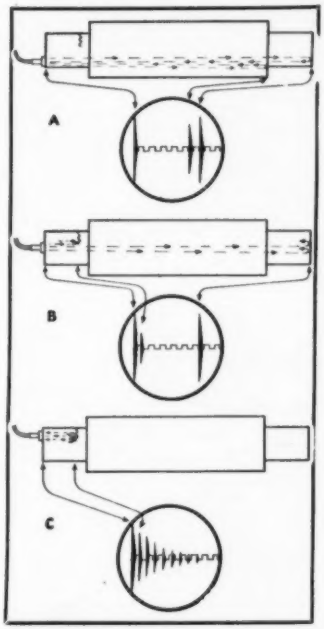


Figure 1, above: Three positions of the searching unit (small T-shaped object at extreme left) and the reflectograms for each (circles) as shown for tests of a six-ft. shaft with one-ft. bearings at each end, and a fatigue crack near one end. Distances between indications on the reflectograms are in direct ratio to actual distances. Note reflection "C" where pulse is reflected back from crack but continues to echo back and forth.

Figure 2, below: Inspecting the main shaft of a 48- by 60-in. jaw crusher.

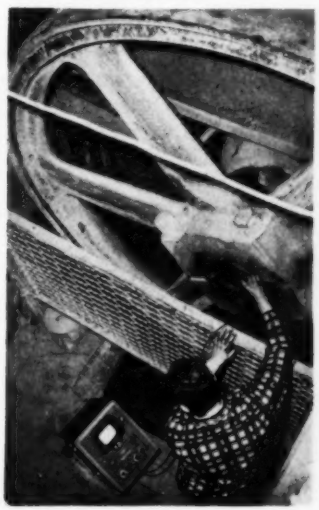


Figure 3: Ultrasonically testing a spare shaft for a 42-in. gyratory crusher. Insert shows reflections from shoulder at 8 in., the center shoulder at 12 ft. 6 in., and the other end at 25 ft.

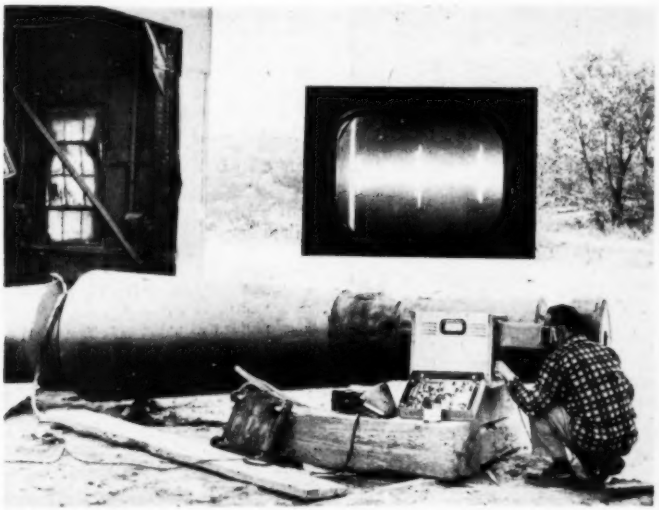


Figure 4, above: Broken end of a 20-in. crusher shaft showing fatigue crack located previously by ultrasonic inspection.

Figure 6, above: Inspecting drill bits for possible fatigue cracks at the shoulder of the threaded end. Figure 5, below: Testing the square take-up shaft of a 5-yd. electric shovel. Insert shows reflections from far end as well as shoulder near that same end.

driven generator provides a satisfactory source of power. As most of the equipment at the New York Trap Rock Corp. quarries is electrified, the necessary power was easily obtained at any point.

The initial test program covered a period of three days, during which time the most critical equipment was inspected at the Clinton Point, Tomkins Cove, and Haverstraw plants. Various types of crusher shafts, a total of 26, were tested and 3 showed reflections from cracks. A vertical shaft in a primary crusher was tested in place and two spares of the type illustrated (Figure 3) were also inspected. Note the indications in the Reflectogram due to reflections from the shoulder 8 in. from the end, the shoulder in the center at 12½ ft., and the reflection from the other end, a distance of 25 ft. Other shafts tested were in primary and secondary crushers, 4, 10, and 20-in. sizes; roll crusher shafts and swing jaw and pitman shafts in jaw crushes. With the exception of one crusher shaft, no difficulty was experienced in testing them all in place, requiring only the removal of end plates and cleaning of the end surface.

One of the 10-in. crusher shafts was cracked at a point 8-in. from the top end and another was cracked at 2½ and 3-in. from the top end, but these were in non-critical areas.

A spare shaft from a 20-in. crusher was tested with head in place and found to have a crack at 5-ft. 7-in. from the top end and was confirmed by testing from the other end. As an emergency replacement this shaft was put back into the crusher. Just 40 days after it was reinstalled it broke apart at the cracked area indicated by the ultrasonic testing (Figure 4) Note the typical fatigue crack of about 40 percent area. (Center projection is bar that was inserted to facilitate removal, and then cut off.)

Shafts on shovels of 4- and 5-cu. yd. capacity were also tested. No difficulty was experienced in testing the driving tumbler shafts, both right and left, and the take-up axle. One take-up axle contained a shallow crack 18- to 18½ -in. from one end and this axle will be carefully watched for further development of the crack.

Other test applications on which only a limited amount of work has been done so far are drill bits and stems. There was considerable variation in the structure of the drill bits and their service record is being watched to determine whether or not minute discontinuities shown by the ultrasonic test indicate poor serviceability.

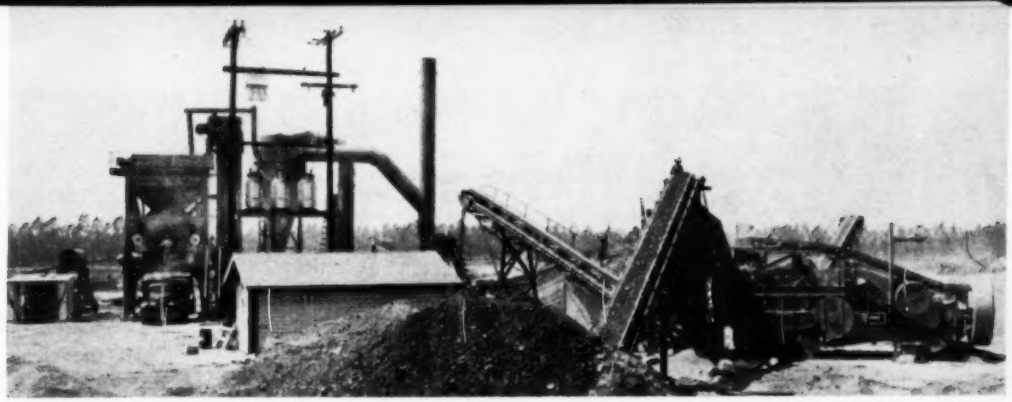
Of two drill stems shown under inspection (Figure 6), one showed crack indications at 5-in. from the end (approximately at base of thread) all the way around. This stem was watched carefully in service and taken out of service three weeks later because a visible crack appeared. No crack indications were noted in the box of the other stem. No tests were made on the balance of the stem, as the box, which was welded on at 30-in. is the critical section.

Detection of cracks in drill bits and stems could forestall costly delays as a result of fishing for broken drill bits or stems, or the complete abandonment of the hole and redrilling.

As a result of their ultrasonic testing investigation, the New York Trap Rock Corp. has started a program for testing at regular intervals all critical shafts. This will be done by their own test engineer with their own Reflectoscope which will be transported to the individual quarries when needed.

The object of such a program is to eliminate the sudden breakdowns that are costly and frequently cause a loss in production that can never be made up. Loss of an important crusher may suspend operations of a shovel and many trucks, resulting in a loss in one day that would pay for the ultrasonic inspection of all the equipment for a whole year.

By testing critical equipment at reasonable intervals, fatigue cracks can be detected and their subsequent growth followed, thus allowing an opportunity to schedule replacement or repair at a time when production will be least affected.



The Noble plant installation near Olive, Calif. The asphalt plant is at the left and the aggregates crushing and screening plant at the right.

California Contractor Pleased With Compact "Packaged" Plant

another ON THE SPOT report

By HARRY F. UTLEY

WHEN Robert J. Noble, southern California contractor and road builder, decided recently to erect a modern hot-mix asphalt plant, producing his own aggregates as well, he chose at the outset to avoid the headaches of hit-or-miss equipment assembly. Instead, he investigated the advantages of "packaged" plants in which the component parts are pre-engineered to operate efficiently and economically as an integrated unit. He was thus able to determine in advance his exact capital outlay, production capacity, operating cost and the various other items entering into the conduct of the business.

Now in his first full year of operation, Mr. Noble is justly proud of the efficient, compact installation situated on the banks of the Santa Ana River near Olive, Calif. The river bed is the source of the clean, hard aggregates which are processed in a Cedarapids Master Tandem portable crushing-and-screening plant. Alongside stands the latest model Standard Steel Corp. 4000-lb. asphalt plant. Finished aggregates are stockpiled and 'dozed directly to the short feed conveyor supplying the asphalt plant, avoiding rehandling almost completely. Both the hot-mix and the crushing-and-screening plants are intended as permanent installations, but the extreme portability of the entire layout could make moving to another location a relatively easy task if job opportunities should dictate this at some future date.

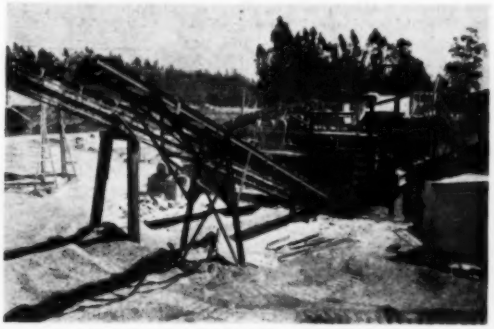
The Cedarapids plant, with wheels and pneumatic tires removed, is mounted on concrete foundations. Crushing is done by a Cedarapids 10- by 36-in. roller-bearing jaw crusher and a set of 40- by 22-in. rolls, the former taking top-deck oversize from the Cedarapids 4- by 12-ft. double-deck screen incorporated in the plant, the rolls being fed from bottom-deck rejects. A raff-wheel return system keeps the plant compact, overall length being just over 36 ft. A Symons scalping screen was cut into the circuit ahead of the plant to take out a conglomerate product for special uses, the inclined conveyor from the pit hopper feeding to this screen. Three stacker conveyors build up finished stockpiles, top size of which seldom exceeds ¾ in. Practically all the output is utilized in the asphalt plant, although some road-base material is sold. Output has been as high as 140 t.p.h. Power for the entire Master Tandem plant is supplied by a single 125-h.p. electric motor.

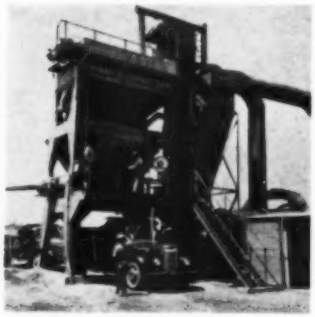
Brown-Bevis Equipment Co., Los Angeles, distributor for the Iowa Mfg. Co. in southern California, sold and serviced the aggregate plant.

The asphalt plant is Standard

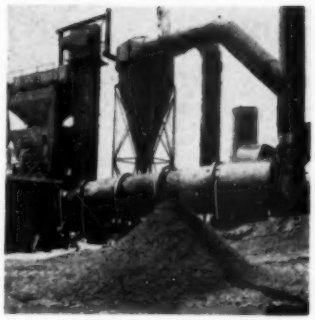
Oil and bitumen storage, some of it in underground tanks, is handled by this piping system.

Stockpiling conveyors leading from the compact aggregates plant.





Dump trucks being loaded with bituminized mix beneath the 4,000-lb. hot plant.



This view of the asphalt plant shows the dryer and dust-collecting system.

Steel Corp.'s newest Series SM 4,000-lb. installation. It has a capacity of 160 t.p.h. of bituminized mix, has all-electric drives and has a combination cyclone and wet-collector dust-and-fume arresting system. Aggregates stockpiled close by are fed by bulldozer over a reclaiming tunnel, a short belt in the tunnel feeding into the boot of the cold-material elevator which, in turn, discharges into the upper end of the dryer.

The Standard 6- by 30-ft. rotary dryer has an all-welded steel shell and is fired by a gas-oil steam-atomizing combination burner. After drying, the aggregates are carried up by an enclosed bucket elevator to a Symons 4- by 12-ft. vibrating screen. The hot elevator enclosure also acts as a plenum chamber in connection with the dust-collecting system, reducing the amount of dust to be removed later at the screen and mixer. The dried aggregates, re-sized by the screen, drop to a 4-compartment storage bin above the batching and mixing floor.

Batching is manually controlled by "easy-motion" levers designed to reduce operator fatigue and speed up operations. The asphalt bucket is steam-jacketed with provision for even distribution along the entire length of the mixer. Individual springless dial scales register weights of the aggregates and asphalt separately. The twin-shaft mixer is lined with removable cast-alloy liners, paddles being of an improved type designed to eliminate segregation. A 45-sec. mixing cycle is standard operating procedure.

Asphalt storage tanks are located below ground and steam for heating is supplied by a Cleaver-Brooks boiler. The entire set-up, including bitumen and fuel pumps, heating coils, pressure regulators, piping, etc., was supplied and installed by Standard Steel Corp., Los Angeles.

The Noble organization engages in street and highway paving and maintenance work throughout Orange County, including the principal cities of Santa Ana, Fullerton and Anaheim. Besides producing and processing its material, it also operates its own grading, spreading and rolling equipment.

A. S. T. M.

(*From page 86*)

tentative specifications for publication in the 1951 supplement to the book of standards. They are tentative specifications for mineral wool felt insulation (industrial type), tentative specifications for mineral wool batt insulation (industrial type) and, tentative specification for mineral wool blanket insulation (metal-mesh covered) (industrial type). Other activities of the subcommittees of Committee C-16 during the year include the completion of method of test for determination of the density of preformed block-type thermal insulation, method of test for determination of density of preformed pipe covering, specifications for mineral wood pipe insulation (molded type), and a specification for mineral wool pipe insulation (blanket type).

Expanded Clay-Shale

(*From page 89*)

Exhaust gases are now reduced in temperature to:

$11.84 \times 141{,}000 = 1{,}670{,}000$ B.t.u.'s kiln input

$1{,}670{,}000 - 842{,}000 = 828{,}000$ B.t.u.'s waste heat, or $\frac{828{,}000}{2512 \times 0.27} = 1220$ deg. F. exhaust.

Reduction of excess air to 20 per-cent will leave $1{,}385 \times 0.2 = 277$ lbs.

$1030 - 277 = 753$ lbs. air eliminated

$753 \times (1{,}220 \text{ deg.} - 50 \text{ deg.}) + 0.27 = 238{,}000$ B.t.u.'s or saving of 238,000

$\frac{238{,}000}{141{,}000} = 1.67$ gal. oil.

Fuel consumption is now reduced to ..... 10.17 gal. oil/yd.
120 lbs. coal/yd.
159 thous. feet gas/yd.

$10.17 \times 8.25 \times 14.2 = 1190$ lbs. air; or 1,274 lbs. products of combustion.

$1{,}274 + 277 = 1{,}551$ total gases

Heat input is now $10.17 \times 141{,}000 = 1{,}435{,}000$ B.t.u.'s.

Heat in exhaust gases is 842,000 B.t.u.'s less or 593,000 B.t.u.'s.

Exhaust gas temperature is then $\frac{593{,}000}{1{,}551 \times 0.27} = 1{,}410$ deg. F. (end of preheating zone no moisture in clay).

With the available heat units in the exhaust gases under these conditions, the clay or shale could have a moisture content of up to 15 percent without increasing fuel consumption, provided that there is a fairly efficient drying section in the kiln. Up to 25 percent moisture could be evaporated with the original 15 gal. of oil without decreasing kiln capacity under favorable drying provisions. The economics of such drying is here greatly influenced by the physical nature of the material.

The rotary kiln must perform two jobs: it must dry and preheat the clay by convection, and it must partially melt the material at high temperatures by radiation plus convection. For the first job, except in rare instances where special convection heat exchange units and elements are built into the preheating zone, the ordinary simple kiln is not well adapted. For the final job of radiant heating, its function as a material agitator, conveyor, material granulator, and combustion chamber is well accomplished. Each section must be treated separately, and should be divorced entirely, both in design as well as heating computations. An engineered heating system is therefore composed of drying, preheating, bloating, and recuperating cooling sections, all of which may be designed into a single kiln unit, or into as many separate units. The type and grading of the raw shale or clay will determine the best combination and number of units.

Relationship of Kiln Capacity and Efficiency It should be kept in mind that there are fixed limits to the output and the practical efficiency of any one

(*Continued on page 108*)

Report on Current Labor Developments

Penalties for Wage Violators

THE Wage Stabilization Board has agreed unanimously on a policy for handling violators of its rules and regulations. It is important for every employer to understand fully the risks involved if unlawful wage increases are made.

In announcing its enforcement program, the Board indicated the factors which, in its judgment, made the program necessary. It pointed out that the Board has already received reports of a substantial number of wage violations. It then went on to say, "To disregard such violations, whether they be wilful or made through honest mistakes or ignorance can and will impair the entire anti-inflation program. It also places violators in a decidedly advantageous position in obtaining manpower, and leads to the practice of pirating critical manpower. To insure compliance with the law, it is, therefore, necessary that strong enforcement action be undertaken as soon as possible."

Legislative authority for its action is found in Section 405-(b) of the Defense Production Act which says:

"No employer shall pay, and no employer shall receive, any wage, salary, or other compensation in contravention of any regulation or order promulgated by the President under this title. The President shall also prescribe the extent to which any wage, salary, or compensation payment made in contravention of any such regulation or order shall be disregarded by the executive departments and other governmental agencies in determining the costs or expenses of any employer for the purposes of any other law or regulation."

In this connection, the President has delegated his authority to the Economic Stabilization Director who, in turn, has redelegated it to the Wage Stabilization Board. To discharge its responsibilities that Board passed a resolution which provided that, where any wage, salary or other compensation is found by the Wage Stabilization Board to have been made in contravention of the Defense Production Act of 1950 or the regulations, rulings or orders promulgated there-under, the following penalties shall apply.

Upon certification by the Wage Stabilization Board, the Executive Department and other agencies of the government shall *disregard and disallow the entire amount of such payment and not merely an amount representing the increase made in such wage or salary in contravention of the Act* for these purposes:

1. In calculating deductions under U. S. revenue laws.
2. In determining costs or expenses under any contract made by or on behalf of the United States, directly or indirectly.
3. In the setting or approving of any price ceilings, and
4. In determining costs or expenses of any such employer for the purpose of any other law or regulation whether herefore or hereafter enacted or promulgated.

In addition, the Board resolution provided that where any wage, salary, or other compensation payment is determined to have been made in contravention of the Act, the Board may recommend to the Executive Departments and agencies of government responsible for the issuance and granting of priorities and material allocations that such Department or agency withhold priorities assistance and the allocation of material from the employer who has made such payment.

These are severe penalties indeed. Particularly, the requirement that the total payment of illegal wages be disallowed for income tax and other purposes could easily bankrupt an employer. In that connection the Board recognized that some of these illegal wage increases may have been made innocently because of failure to understand or under certain extenuating circumstances. It provided, therefore, that where it finds extenuating and mitigating circumstances it may determine that a lesser amount shall be disregarded and disallowed. Where the Board does reduce the amount it may prescribe the departments who will be bound by its determination.

In addition, of course, the criminal penalties of the Act, which provide a $1,000 fine or 1 year imprisonment or both, may be incurred both by the employer who makes illegal wage payments and by the employee who receives them.

Having set forth the general enforcement rules, the Wage Stabilization Board then created a National Enforcement Commission to administer the enforcement program. This Commission, composed of three persons who are not members of the Wage Stabilization Board, is charged with the responsibility of making the required recommendations, determinations and certifications. Similar Commissions will be established in each regional office of the Wage Stabilization Board. Employers who have been charged with violations will appear before the Commissions rather than the Wage Stabilization Board itself.

In view of the severity of the penalties, employers so charged would be well advised to make sure that their cases are completely and competently prepared.

By S. HERBERT UNTERBERGER
S. Herbert Unterberger & Co.
Industrial and Labor Economists
Washington, D. C., and Philadelphia, Pa.

Four Important Boycott Cases

The Supreme Court recently issued four very important decisions on the question of what constitutes a secondary boycott in violation of the Taft-Hartley Act.

In the first decision, the Supreme Court said that ordinary picketing in the traditional manner is not a prohibited secondary boycott. A group of pickets on strike tried to prevent the driver of a truck belonging to another employer from entering the premises of the struck employer. Here the Court said that all the pickets were doing was trying to induce neutral employees individually to boycott the struck employer. This, the Court said is not a secondary boycott. In this case, the Court still left open the question of whether it is legal for pickets to try to induce, not individual employees, but groups of empolyees or employers to refuse business with struck employers.

In the second and third cases, the Court found the unions guility of conducting secondary boycotts when they struck the general contractors and other subcontractors for the purpose of getting the general contractors to remove non-union subcontractors. The important fact here was the existence of the subcontract which the union tried to get broken by use of the strike weapon. A strike with such an object was deemed to be illegal.

In the fourth case, the union members left a job where non-union workers were employed because of a union rule against working with non-union men. This, too, the Supreme Court found to be a prohibited secondary boycott.

Expanded Clay Shale

(*From page* 106)

kiln. The plant operator and designer must understand these, or money can easily be spent in the wrong direction.

With any one kiln installation in which output *is not* increased, we can save on fuel by:

(1) Reducing leakage as well as excess combustion air by draft control and efficient gas seals. Savings on the fuel dollar may reach 10 cents.

(2) Preheating combustion and unavoidable excess air with sensible heat in hot clinker by installing any of several types of recuperating coolers. Savings here may amount to 20 percent or more of the fuel dollar.

(3) Insulation of the whole kiln system in conjunction with special firing arrangement. Up to 5 percent can well be returned on the fuel bill.

The capacity of a given installation can, of course, be increased somewhat with an increase in fuel consumption per cubic yard of aggregate produced. However, to increase kiln capacity without such a resultant drop in thermal efficiency requires that two conditions be fulfilled: (a) the low-temperature heat-transfer zone must be re-designed to provide greater gas-material contacting surface plus greater gas velocity in contact with material; and (b) the high-temperature heat transfer zone must be lengthened through special burning techniques. When these two alterations are made, the ordinary simple kiln can be stepped up very considerably in production. Because of this increased output, radiation losses are further reduced per cubic yard of aggregate; and the improved heat transfer also brings on some slight saving, the more so the wetter the incoming material.

Since it is evident that not thermal efficiency but overall efficiency is the final basis of processing cost savings, the greatest saving in the production of a cubic yard of aggregate is through reduction in cost of labor, power, depreciation and overhead because of increased output with minimum additional investment. These four potential factors for increasing efficiency, namely excess and leakage air reduction, sensible heat recuperation, radiant heat saving, and increased capacity through special burning technique and preheaters, can readily be made available to any existing plant through applied thermodynamics. Savings on fuel alone may well reach 35 percent in some cases, and production increases of 30 to 50 percent are in the picture for many plants—a good deal more under certain conditions.

The diagrams of Figures 1, 2, 3, 4, 5, show the sequence of how heating efficiency can be stepped up within practical limits, and how the heat input and losses are distributed. Heat is shown in terms of cents on the original fuel dollar. It so happens that since the basis for the original conditions is on an assumption of fuel cost at 46 cents/million available B.t.u.'s (such as oil at 6½ cents/gallon), it appears that one fuel dollar is actually the cost per cubic yard at the outset with a standard inefficient installation.

In a following article, the discussion will take up the various process control problems as they apply to this particular industry.

FRANCIS J. COLLINS was elected vice-president of the Kelley Island Lime and Transport Co., Cleveland, Ohio. Mr. Collins has been general sales manager of the company.

GERALD R. STARK, Texas Vermiculite Co., Austin, Tex., has been elected president of the Vermiculite Institute. J. B. LYALL, Vermiculite Northwest, Inc., Spokane, Wash., was elected to the board of directors.

FRED A. MANSKE, vice-president in charge of production of the National Gypsum Company, Buffalo, N. Y., has been elected a director of the company. He succeeds EDWIN F. GUTH who has resigned. Mr. Manske has been associated with National Gypsum since 1934.

NELSON C. WHITE has been named general manager of the potash division of International Minerals & Chemical Corporation of Chicago, Ill., and SINCLAIR B. MCCOY has been appointed sales manager for agricultural potash.

M. MOSS ALEXANDER has been elected president; E. W. HENNE, vice-president and treasurer; and JOHN H. MCNATT, vice-president and secretary of the Missouri Portland Cement Company, St. Louis, Mo. Directors elected included D. K. CATLIN, and FRANK B. COLEMAN, and JAMES G. FORSYTH.

The Texas Gulf Sulphur Company recently elected WALTER H. ALDRIDGE chairman of the board, and FRED M. NELSON was elected to succeed him as president. THOMAS S. LAMONT was named chairman of the newly formed executive committee.

THOMAS E. CAMP Jr. has joined Southwest Potash Corporation of New York City as vice-president in charge of sales. Mr. Camp was formerly division manager of Armour Fertilizer Works, Atlanta, Ga.

RUSS A. LOVELAND is the new works manager of the Halliburton Portland Cement Co., plant at Corpus Christi, Tex.

Mr. Loveland was formerly superintendent of the Nazareth No. 4 plant of Penn-Dixie Cement Corp., Nazareth, Pa. While there he established the enviable safety record of 650 days of no-lost-time accidents.

ELLROY KING, vice-president of Halliburton Portland Cement Company, Corpus Christi, Tex., has been appointed a member of the Cement Industry Advisory Committee, a division of the National Production Authority.

J. F. VOELKER has been appointed superintendent of Plant No. 4 of the Nazareth, Pa., plant of the Penn-Dixie Cement Corporation, succeeding R. A. Loveland, who resigned to accept a position as works manager for the Halliburton Portland Cement Co., Corpus Christi, Tex.

JAMES G. FORSYTH was elected a director of Missouri Portland Cement Company, JOHN H. MCNATT was elected vice-president and secretary.

DR. I. M. LEBARON has been appointed director of research laboratories for the International Minerals and Chemical Corporation, Chicago, Ill. He has been a research engineer with the company. In his new position Dr. LeBaron will direct the research programs in the various laboratories of the company.

NICHOLAS FARBER, president of the Farber White Limestone Company of Franklin, N. J., was elected president of the Associated Limestone Producers of the Northeast, Inc., and ALBERT A. MASICK, owner-manager of the Masick Soil Conservation Company of Schoharie, N. Y., was elected vice-president, at the annual association meeting held in Albany, N. Y.

obituaries

WILLIAM A. BUSENHART, superintendent of the Ramsey Agstone Co. of Ramsey, Ill., died suddenly on May 9 while engaged in his duties at the quarry two miles west of Ramsey. Mr. Busenhart, whose death was attributed to coronary thrombosis, was a 62-year-old resident of Vandalia, Ill.

DOUGLAS P. HALL, former partner in the T. J. Hall Sand & Gravel Co. of Cincinnati, died on May 17. Mr. Hall, a native of Aberdeen, O., was 63 years of age.

JAMES R. RANEY, 70 years of age, chairman of the board of the Industrial Silica Corporation, Youngstown, O., died on May 9 at his home in Chicago.

GEORGE A. DOBBIE, 71, president of the Gypsum Lime and Alabastine Canada, Ltd., and one of Canada's leading industrialists, died on May 24 at Galt, Ont., after a long illnes. He served on the board of directors of a large number of Canadian and U.S. firms and was a past president of the Canadian Chamber of Commerce.

VINCENT ZUPANICIC, a retired employee of the Marquette Cement Manufacturing Company, suffered injuries which proved fatal when he was struck by an automobile near his home at Oglesby, Ill. Because of heavy rain the driver of the car did not see Mr. Zupanicic.

E. J. ALLEN, chief engineer for the Kentucky Stone Company, Louisville, Ky., since 1939, died at his home in Lawrenceburg, Ky., on May 24. He was 61 years of age.

JOHN R. LEINBACH, chief engineer, Lehigh Portland Cement Company, died June 19 in a Philadelphia hospital. Mr. Leinbach, 62, had been ill for the last few months and confined to the hospital for six weeks before his death.

JOSEPH ALFREY, 35, quarry superintendent, and ROY HOLLENBECK, 55, a crusher feeder for the Manteno Limestone Company, Manteno, Ill., were killed in a freak accident that occured while they were repairing a gravel bin. A rope being used to hoist large beams from the old floor became tangled in an operating stone crusher causing the line to tear loose and release a beam which fell on the two men. A third man was injured slightly.

ALBERT HARRISON HINKLE, 71, division director of the Asphalt Institute, died on June 8 at a hospital in Columbus, O. Mr. Hinkle had moved to Columbus in April from the firm's Cincinnati office.

A former secretary and president of the Mississippi Valley Conference of State Highway Departments, Mr. Hinkle was appointed by the United States Secretary of Agriculture in 1924 to the committee which was to select a system of national highways and prescribe a standard for marking them. Prior to that he had organized the maintenance department of the Ohio State Highway Department.

Mr. Hinkle was nationally known for 40 years as a pioneer in highway paving and maintenance.

FRANKLIN M. HOOVER, 82, retired district sales manager for the Nazareth Cement Co. of Philadelphia, Pa., died on June 4.

FRANK E. RICHART, 59, professor of engineering materials at the University of Illinois died recently. He had been in poor health for several years. Mr. Richart was widely known for his work on reinforced concrete, and was a former member of the American Concrete Institute. An honorary life membership was awarded him by the A.S.T.M. at its annual meeting this year in recognition of his contributions to the knowledge of testing concrete and other materials.

CHARLES C. SPENCER, 78, retired purchasing agent for the North Jersey Quarry Company, Morristown, N. J., died recently at his home.

JOSEPH C. RICE, 56, an employee of the American Silica Sand Company, Ottawa, Kan., died recently at his home.

R. C. FLETCHER, vice-president of the Flint Crushed Gravel Company, Des Moines, Iowa, died July 7. Mr. Fletcher, a past president of the National Sand and Gravel Association, and for many years active in that association's affairs, was well known among sand and gravel producers.

J. STANLEY DOWNS, 74, retired superintendent of the Hercules Cement Corporation plant at Stockertown, Pa., died at his home in Easton, Pa. recently. Mr. Downs spent more than 40 years in the cement industry, the last 20 of them as superintendent of the Hercules plant.

CLARENCE R. "BOB" JOHNSON, 61, district representative for the western sales division of Caterpillar Tractor Co. died suddenly of heart attack in a Sacramento, Cal., hospital on June 13. He went to the hospital for two days after a light attack, and apparently was recovering when death came.

EDWIN T. VIOSARD, 76, former general manager and superintendent of the Gehres stone quarry in Buffalo, N. Y., died suddenly June 13.

JAMES M. WALTON, 42, agricultural lime salesman for the Oregon Portland Cement Company, Portland, Ore., died recently in a hospital at Oswego, Ore. Before joining Oregon Portland Cement Company he had operated the Agricultural Lime Distributing Company of Eugene, Ore.

GEORGE H. BUNKER, 69, former president and a director of the Interstate Amiesite Company, Wilmington, Del., died recently in Philadelphia, Pa. Mr. Bunker retired from the presidency a few months ago after serving in the company for 25 years.

SEELY B. PATTERSON, president of the Calcite Quarry Company, Lebanon, Pa., died recently after an illness of four months. He was 66 years of age. Mr. Patterson had headed the quarry company for 31 years.

J. HOMER HUNT, 75, Atlanta, Ga., retired executive of International Minerals and Chemical Corporation, died suddenly at Hot Springs, Va., where he was attending a meeting of the company.

LUKE E. TATE, 72, retired director of the Georgia Marble Company, Tate, Ga., died recently in an Atlanta hospital. Mr. Tate had served four terms in the Georgia Legislature as a representative from Pickens County, and had been an assistant solicitor general of the state.

REINHOLD E. WINTER, 64, died suddenly of a heart attack on June 16. Mr. Winter has been in charge of the Chicago sales agency of the Williams Patent Crusher and Pulverizer Co., St. Louis, Mo., for the past 16 years. He had a total of 47 years with the company.

JAMES L. LAND, 46-year-old assistant sales manager for the Missouri Portland Cement Co., died in Memphis, Tenn., on June 13.

MANLEY E. JOHNSON, 93, who operated a lime and stone plant in Northern New York for many years, died July 3, at Gouverneur, N. Y. He was in business at Bigelow, N. Y.

Lightning caused the death of JOSEPH KROON, 32, while at work at the Kalamazoo County gravel pit, Kalamazoo, Mich.

Edwin H. Parkhurst, 79, former president of the Euclid Road Machinery Company, Cleveland, Ohio died recently. Mr. Parkhurst was president from 1937 until recently when R. Q. Armington was elected to the position.

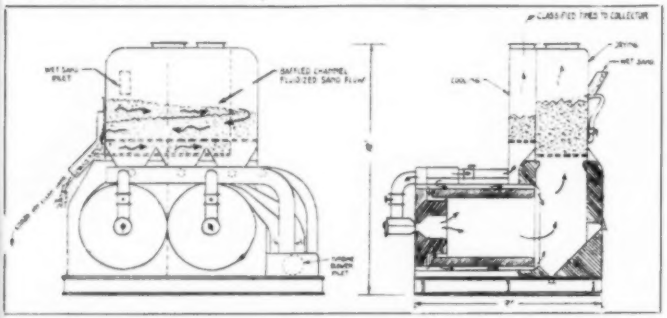
new machinery and supplies

PIT AND QUARRY

● Multi-Purpose Dryer

The "Turboflo" combination sand dryer, scrubber, de-duster, and classifier is an integrated multi-purpose unit which allows several heretofore separately conducted processes to be performed within one single compact device. It is specifically designed to dry sand or sand-size minerals at very rapid drying rates and at high thermal efficiencies.

The short drying time is accomplished by use of the open-channel fluidization technique in stream flow as developed and applied in pilot tests, which makes possible hight heat transfer rates due to non-short circuiting baffled stream flow of solid grains in turbulent aerated condition. Thermal efficiencies are high because a relatively wide temperature differential can be maintained between incoming and outgoing gases to and from the fluid bed.



This device or system not only dries the material thus, but it has been found that the scrubbing action produced by the colliding grains cleans them of any adhering clay, wet dust, or other surface impurities, and automatically removes such fine material by entrainment in the gas stream leaving the fluid bed. This scrubbing action is augmented not only by subsequent de-dusting or removal of the freed material by entrainment, but through careful adjustment of the gas velocities in any one or all of the baffled sections of the drying and cooling channel; and classifying action is produced which makes possible the removal of any particular fine size fraction during operation. Thus the system is designed to provide for the cyclonic collection of these finer sizes as a distinct product or by-produce of the process.

Heat is generated in a specially designed lower combustion and gas-air mixing chamber made integrally with the drying chamber in order to achieve compactness and lower heat losses. Fluidization and drying air is introduced through the double shell cylinders surrounding each combusition tube. The air is given a strong rotating motion by a spiral baffle in the annular space in order to contact the total cylinder surface evenly, and to produce a strong mixing vortex at the nozzle-like end of the combustion tube. This is very essential in such a compact design, so that the gases will be well mixed and will have a uniform controlled temperature as they pass through the heat-resisting grid between the lower hot gas chamber and the upper drying zone of the fluidized material. Fuel may be pulverized coal, gas, or oil.

The moist material is fed onto a specially designed steel apron which is the end lip of the feed chute from the feeder. A small quantity of air under fluidization-air pressure from the central air manifold disperses and distributes the moist material evenly over the surface of the hot boiling sand. This is an essential feature in this unit for introducing wet material to the fluidized drying bed.

It might be mentioned that this very moist material in the first feed section of the drying channel is fluidized by gases that are both at higher temperature and greater velocity, thus giving this section high turbulency to prevent packing or arching and to aid rapid mixing between wet and partially dried sand. Due to the

● Crawler Tractor

A multi-purpose crawler tractor powered by a four-cylinder Continental F-140 engine and including other standard parts is being made by the American Tractor Co., Churubusco, Ind.

Named the "GT 30 Terratrac," it weighs 4,400 lbs. fully equipped with bulldozer. This lightweight is said to give less deadload and increased economy. Speed and impact are used to accomplish the work done with weight and creeper speeds of standard size units. Rubber track shoes have been developed so that the Terratrac can be operated on concrete or other floors. Top speed is about 5 m.p.h.

Interchangeable crawler gauge widths from 42- to 72-in. give stability in rough going. Other attachments include angle dozer, bucket loader, winch, and scoop, while a three-point hydraulic lift makes rear mounted tools readily adaptable.

B.F.Goodrich

These tires carry 95 tons over crushed limestone—with ease!

HAULING heavy loads over jagged rock in all kinds of weather calls for tires that can really "take it." Yet this is an everyday occurrence for these B. F. Goodrich Rock tires. The BFG's shown here are used on vehicles that haul limestone and shale from quarry to plant. The total load is 190,000 lbs., of which 88,000 lbs. is pay load.

B. F. Goodrich tires can give this kind of service because they are built to stand up under the most hazardous quarry and construction hauling conditions. For added protection, the patented *nylon shock shield* is built into all B. F. Goodrich tires of 8 or more plies. Extra strong, elastic nylon cords are placed between the tread rubber and the cord body. Under impact, these cords work together, absorbing and distributing the shock evenly. The shock shield protects against bruises and means more recappable tires as well as longer service. Here is a construction advantage which is found only in BFG tires — and at *no additional cost.*

B. F. Goodrich tires are also available in all-nylon construction. For these or any off-the-road tires see your BFG dealer. Or write for additional information on these tires that do a better job at lower cost. *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

deep bed and greater mass of solids in this zone, a thermal flywheel is created which acts to hold the bed above condensing temperatures and at the same time maintains a high hot-to-cold sand ratio during feeding.

The almost-dry sand, upon reaching the end of the heating and drying channel, flows over and through an adjustable baffle into the finish-drying channel. Here the sensible heat in the material is employed to heat the cold fluidizing air coming up through the grid, which then finishes the drying without outside heat added. As the stream rounds another 90-degree turn and flows along the last section of the smaller channel, it is cooled progressively on the way. In this last stage, air velocity can again be increased to any value required for classifying and entraining certain fine fractions, or to give the sand a final scrubbing and cleaning. The grids in the narrow finishing and cooling channel are on a higher level in order to produce a shallower stream with the available head room above the heating cylinders. Cold air to the grids is also sectionalized for control.

The Turboflo dryer unit is built compact and complete on its own steel base in sizes from 3 to 30 t.p.h. A standard machine of 10 t.p.h. dry sand capacity occupies a space of only 12 ft. by 9 ft. by 12 ft. Tests extending over several years have been completed, and units will be manufactured by the General Machinery Company of Spokane, Wash., under license to Bauer Fluidization Engineers of Seattle, Wash. The Turboflo machine is portable, automatic, once it has been adjusted to the desired conditions of moisture, cleaning, scrubbing, or classifying, and is adaptable to a wide range of sizes from ¼-in. down to dust.

● Rear-Dump Trucks

Two new rear-dump model trucks are being made by the Euclid Road Machinery Co., Cleveland 17, Ohio. The new models are of 22-ton capacity and feature spring mounted drive axles.

Both models have a ten-speed transmission which provides a top speed of 32 m.p.h. loaded. The planetary drive axle is mounted on free-floating springs and positioned by longitudinal radius rods. This is said to prevent breakage of leaves due to twisting strains. The spring suspension has a varying contact center that provides cushioning of the truck under all loading conditions.

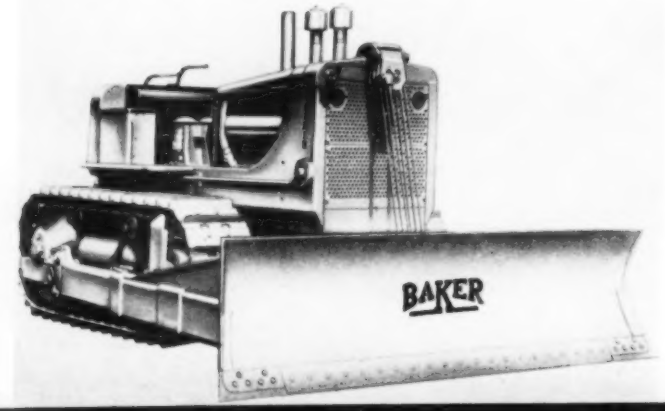
Other features are: air assist clutch, hydraulic-booster steering, comfortable drivers seat, and optional heating of the truck body. Both models may be obtained with standard or quarry-type bodies. The 46TD is equipped with a Cummins diesel 300 h.p. engine while the 45TD has a Buda 286 hp. diesel engine.

● Cable Control

Redesigned cable control mountings for the larger bulldozers, root rippers, and other front-end attachments of the Baker Manufacturing Co., Springfield, Ill., to be used on Allis-Chalmers crawler tractors have been announced.

The new mountings are for A-C models HD-9, HD-15 and HD-20. The new design provides maximum visibility, streamlined appearance, easy interchangeability, greater protection for cables and radiator, and a push beam power tilt.

The low frame of the new mounting increases visibility to the maximum and the location of the cable under the fender protects it from being snagged. Other features of the Baker line have been retained.



● Screen Heater

Applicable to old or new installations of No. 2 mesh or smaller woven wire screen, the Hannon Electric Screen Heater is said to speed up the screening of such moist materials as sand, limestone, lime and other materials.

The heater can be installed on gravity or vibrating screens. It consists of a step-down transformer that converts 220-,440-, or 550-volt alternating current to low-voltage heating current.

Special bus bars extend the full length of the screen on either side. The screen acts as a resistance to the flow of the current and is heated just enough to reduce the moisture content of the material so that it passes through the mesh without blinding. According to the manufacturer screen capacity may be increased

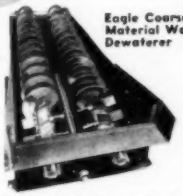
up to 50 percent and beating to open the screen is unnecessary.

The voltage and temperature developed are such that no fire or electrical shock hazard exists. The heater is a product of F. R. Hannon & Sons, 1660 Waynesburg Road S. E., Canton, Ohio.

● Heavy-Duty Fenders

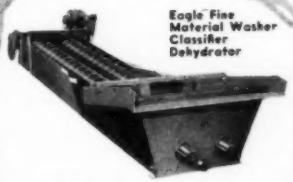
Fenders of one-half inch steel plate are now standard equipment on Caterpillar D8 tractors. These fenders were designed to take greater abuse and to serve as a more rigid platform for mounting equipment. These fenders were previously offered as special equipment. Caterpillar Tractor Company, Peoria, Ill.

Eagle Coarse Material Washer Dewaterer



Essential for today's demand for clean aggregates. Sizes to handle 90 to 350 tons per hour. Also single screw units.

Eagle Fine Material Washer Classifier Dehydrator



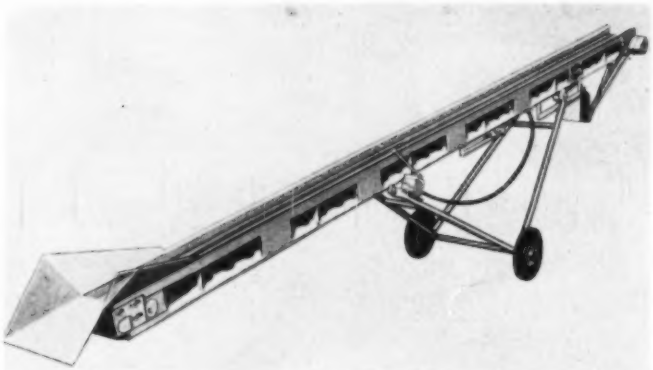
Reject or retain fines at will by raising or lowering lips of U-shaped weir. Washes sand clean—delivers it free of excess moisture. Sizes 15 to 200 TPH.

a good wash day EVERY DAY at Karl Hehl's gravel plant— with EAGLE Washers on the job!

Eagle Washers rule out "wash day blues" at the plant of Karl Hehl, Adams City, Colo. An Eagle double screw coarse material washer loosens and soaks pit-run material, washes it and delivers it dewatered to a vibrating screen. An Eagle double screw fine material washer, with adjustable long weir, washes, classifies and dehydrates sand which passes through the screen. A simple, economical, compact plant providing a range of readily marketed materials. Iowa Mfg. Co. designed the plant and made the "Cedarapids" conveyor, bins and screen. End "wash day blues" at your aggregate plant—send for Catalog 47.

EAGLE IRON WORKS 133 Holcomb Ave. Des Moines, Iowa

Screw Washers | Log Washers | "Swintek" Dredge Ladders | Clay Crushers | Clay and Cinder Grinders | Shale Planers | Coal Crackers



Light Duty Conveyor

Lightweight aggregate, cinders, and similar materials are easily handled by the Baughman Model 272 portable conveyor.

The conveyor is of the troughing-type with the 10-in. belt sliding on the trough and scaling at the edges when loaded. A shovel hopper is designed to slide into and scoop up the material. Needle bearing wheels with pneumatic tires make moving an easy job. Height of the conveyor is adjusted by a hydraulic hoist. Sealing cleaning wing type head and tail pulleys give positive traction and avoid belt damage from lodged material.

Design for small spaces this conveyor is only 27-in. wide at the axle and can pass through most doorways. Lengths from 16-to 28-ft. are available. The manufacturer is Baughman Manufacturing Co., Jerseyville, Ill.

Battery Charger

Industrial truck batteries up to 55 amp.-hr. capacity may be charged with the new charger produced by the Philadelphia Division, Yale and Towne

Manufacturing Co., 11,000 Roosevelt Boulevard, Philadelphia 15, Pa.

The charger operates on the selenium rectifier principle and is designed to give simplified operation, prolong battery life and save power. An automatic controller is responsible for most of the savings. The controller governs the amount and time of charge. There are no moving parts.

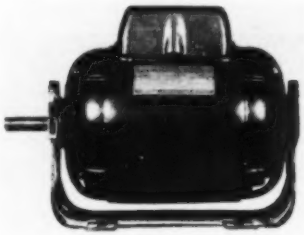
Operation is reduced to plugging in the charger, setting the clocks and throwing a switch. All moving parts have been eliminated including the cooling fan as the extra large plates do not need forced air circulation. Battery protection is complete for old or new batteries as a temperature compensator is built in. The unit plugs into any standard 110-volt 60-cycle outlet. A step-down transformer is furnished for 220-volt current. The charger is available for either lead-acid or nickel-alkaline batteries.

Resilient-Base Motor

Resilient-base construction of the G-E line of Tri-Clad single-phase, capacitor induction motors is now available in ½ to 5 hp. sizes.

The new base is said to isolate the torque pulsation that is present in all induction motors and to prevent it from being transmitted to the driven machine. It is especially useful where freedom from vibration and extra-quiet operation are needed.

The Tri-Clad line of motors are capacitor type and have no brushes or commutators to wear or cause interference with radio or television. The motors are equipped with long-life lubricated ball bearings, and will operate on 115-230-volt, 60-cycle power supply except for the 5-hp. size which requires 230 volts.



Forced Draft Fan

Many new features have been embodied in a forced draft fan manufactured by the Prat-Daniel Corp., and distributed by the Thermix Corp., Greenwich, Conn.

Improved features claimed by the company are: large, deep inlet cones streamlined to reduce turbulence at the inlet; open space between wheels of double-wheel models to permit four-way diffusion of the air leaving the wheels; and an oversize housing to assist diffusion.

The new design of the fan is the result of the cooperative efforts of Prat-Daniel and their associates in Sweden, Great Britain, and France.

Heavy-Duty Boom

Bantam shovel-cranes of the 5-ton truck-mounted models may now be equipped with a heavy-duty boom that increases their work range.

The new boom is designed for lifting and loading operations and has four times more rigidity than the standard ones. The additional strength has been obtained by the use of heavier reinforcing and bracing to resist shock, especially in the lower section.

The boom comes in a 25-ft. length

with 5-ft. extensions available. It is said to be conservatively rated at 10,000-lbs. capacity at 10 ft. with outriggers and 1,000-lb. counterweight. It is a product of the Schield Bantam Company, Waverly, Iowa.

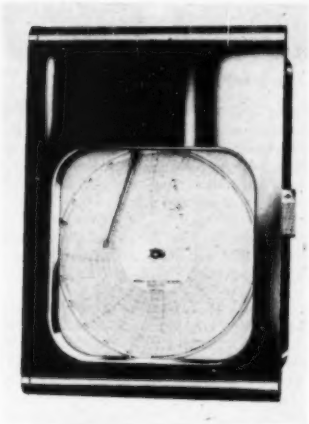
Low Speed Gears

Improved tractor performance, especially in connection with pusher-loader operations for tractor scrapers, is achieved by the use of a new low speed gear group that is being made for the DW-10 tractor by the Caterpillar Tractor Co., Peoria, Ill.

This gear reduces the speed of the first gear from 2.8 m.p.h. so that it can be used in conjunction with crawler-type tractors that have second speeds of 2.3 m.p.h. These matching speeds make pusher loading easier and also add greater tractive effort for self-loading operations. Other gears of the DW-10 remain the same.

● Running-Time Recorder

A new line of running-time recorders has been announced by the Bristol Co., Waterbury 20, Conn. These devices record on a chart the operating or "on" time of a machine. This gives cost information as well as indicating the correct intervals for lubrication, inspection,

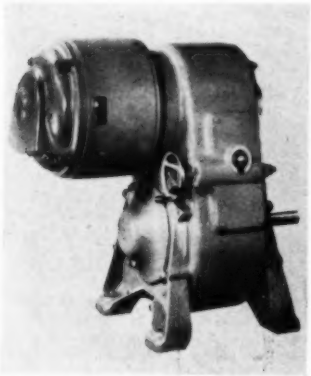


and other items that are dependent on the running time of a machine. The time record is shown on a chart which records both "on" and "off" periods.

Models suitable for wall or panel mounting or for portable use are available.

● Electric Power Drives

Larger horsepower "Speed-Trol" electric power drives have been added by Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Road, Los Angeles 22, Cal. These Speed-Trols provide variable speed drives in the 20- and 25-h.p. range. Models are available with drip-proof



motor and will soon be available with splash-proof and totally-enclosed fan-cooled motors.

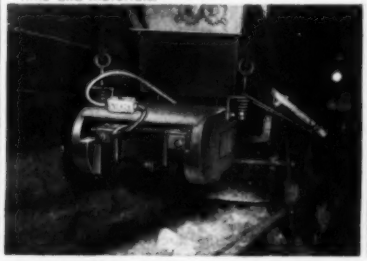
Features of the new models are positive adjustment of pulleys, infinite speed variation and accurate control of speed under varying loads. All models can be supplied with manual, electric or mechanical remote control.

Fast, Economical, Modern Handling Of Rock Products

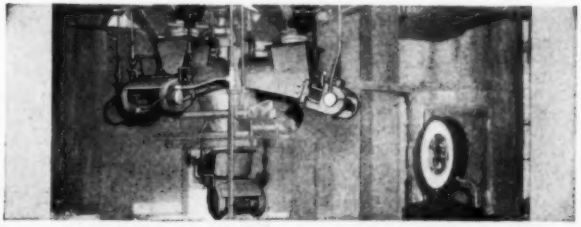
From Light, Fine Powder to Heavy, Coarse Chunks

SYNTRON VIBRATORY EQUIPMENT

ELECTRIC VIBRATORS . . . Assure free-flow of materials from bins, hoppers and chutes—3600 vibrations per minute break down arching and plugging of stubborn materials. Save manpower—eliminate the pounding, rodding and poking that damages bins and hoppers and wastes time and materials.



VIBRATORY FEEDERS . . . Controlled rate of flow gives smooth, even feed of materials—Feeding heavy abrasive ore to dryers—Materials to Ball Mill in Cement Plant—Rock from dump truck to crusher—Discharge from Coke Rod Mill to conveyors—Clay to Pan Mill in Refractory—Lime from kilns in the manufacture of mortar, etc.



BATCH WEIGH PLANTS . . . Accurate, automatic weighing of multiple batches for mixing by remote push button control is achieved through automatic, scale-controlled operation—fast feed—slow dribble—and instantaneous cut-off.

WRITE FOR CATALOG DATA

SYNTRON COMPANY

385 Carson Avenue Homer City, Penna.

trade notes

The Oliver Corporation announces that J. O. Cunningham, assistant manager, has been appointed merchandising manager. He succeeds R. D. Merrill who is on leave to the National Production Authority as branch chief of agricultural machinery and implements.

S. R. Harper

S. R. Harper has been placed in charge of sales promotion and advertising for the Mechanical Goods Division, Goodyear Tire and Rubber Company, Akron, Ohio. He replaces R. W. Sabine who has been promoted to manager of distributors sales for the Mechanical Goods Division.

H. L. Howard

Wall Colmonoy Corporation, Detroit 3, Mich., has opened an office and warehouse at 5815 Clinton Drive, Houston 1, Tex.

Henry L. Howard has been appointed manager of the new office. Mr. Howard has been a welding sales and service engineer for many years, and has been on the staffs of Goodyear Aircraft Company and Republic Steel Company.

Opening of the new office and warehouse will give better service to the Southwest on the various hard facing and other alloy welding rods made by the company.

Bemis Bros. Bag Co., has announced changes of personnel throughout the country. P. J. Hewitt, sales manager of the Peoria, Ill., plant has been named assistant manager. W. F. Mulvaney, assistant sales manager, Peoria, Ill., plant succeeds Mr. Hewitt as sales manager. H. O. Parrent, sales office, Phoenix, Ariz., is appointed sales manager, Los Angeles, Cal. L. P. Sempek becomes representative in Phoenix, Ariz. S. T. Newton, salesman is promoted to sales manager, Memphis, Tenn., plant.

The Rich Creek Fluorspar Corp., Elizabeth Town, Ill., has purchased the Lone Star mine, leading fluorspar producer in Arizona, located in the Whetstone Mountains. The 200-ft. deep shaft will be deepened and the production of 150 tons a month will be increased say the new owners.

Dealers, salesmen, and executives attended the opening and barbecue lunch of the new Allis-Chalmers factory branch at 4646 Peachtree Boulevard, Atlanta, Ga., on June 21.

The branch is designed to utilize the latest methods in parts handling and in servicing of machinery. Conveyors, fork lift trucks and loading docks speed handling and shipping. The building contains 60,000 sq. ft. of floor space, while 8 acres are included in the complete property.

The branch will serve industries in the South Carolina, Georgia, Alabama, and Florida areas. E. H. Polzin, is manager; E. A. Conwell, assistant manager; F. Young, agricultural sales manager; and C. M. Evitt, industrial sales manager.

L. L. Andrus

American Wheelabrator & Equipment Corp., Mishawaka, Ind., has reorganized and expanded its sales staff, according to Otto A. Pfaff president. The reorganization is intended to provide better customer service and to promote the many new applications for the company's products.

Personnel changes and additions are: L. L. Andrus, formerly vice-president in charge of sales is promoted to vice-president and executive head of the Dust and Fume Division.

John A. Silver has been appointed director of sales. He was formerly with Lester and Silver, management and sales consultants. E. B. Rich, Chicago representative, becomes general sales manager. A. E. Lenhard, advertising and sales promotion manager, assumes additional responsibilities. S. S. Deputy, sales manager, will work on special assignments. Bernard Lester, of Lester and Silver, will continue as sales management consultant.

John A. Silver

E. B. Rich

A. E. Lenhard

S. S. Deputy

Chain Belt Company, Milwaukee, Wis., announced the appointment of five new district sales engineers. They are: E. D. Williams, Philadelphia District; T. J. Hammel, Kansas City Office; R. W. DeMott Jr., New York District; K. Burch, Cleveland District; G. Robichaud, Boston District.

Appointment of Thomas E. Wilson as production manager of the GMC Truck & Coach Division has been announced by Roger M. Kyes, vice-president of General Motors and general manager of the division. In his new capacity Mr. Wilson will be responsible for the production, purchasing and traffic activities of the division.

Earl A. Maxwell was named to succeed him as Director of Personnel.

The Industrial Safety Equipment Association at their annual June meeting held at Skytop Lodge, Skytop, Pa., re-elected Charles H. Gallaway of American Optical Company as president.

Elected to the vice-presidency was Earl H. Brooks of Safety Clothing and Equipment Company. Jess A. Brower, Industrial Gloves Company and G. M. Glidden, Acme Protection Equipment Company, were elected to the board of trustees.

Carrying over as board members until next year are Frank R. Davis, Jr., Davis Emergency Equipment Company and Stanley C. Herbine, Willson Products Company. Lawrence E. Dickson, junior past president, automatically continues as a board member for another year.

Election of I. Melville Stein to the newly created post of executive vice-president has been announced by the directors of the Leeds & Northrup Company, Philadelphia, Pa. Mr. Stein has been a vice-president, and is director of research. He joined Leeds & Northrup in 1919 as a division manager in the sales department. He became research director in 1928, and vice-president in Charge of Research in 1944. During World War II he served as a member of the National Defense Research Committee.

Jess Mossgrove

The dump car, trail car and general car business of the Austin-Western Company, Aurora, Ill., will be transferred to and operated from the Baldwin-Lima-Hamilton Corp., Eddystone, Pa. according to Marvin W. Smith, president of Baldwin-Lima-Hamilton.

The change is scheduled to become effective on June 1, 1951. The assets of Austin-Western were acquired by Baldwin-Lima-Hamilton Corp. on March 8, 1951.

Jess Mossgrove, manager of the car department at Austin-Western will remain in charge of that department after it has been moved to Eddystone.

Richard A. Kelting has been appointed manager of the new Newark, sales office of The Falk Corp.

The new office has been established to serve the industries in the northern half of New Jersey, including Bergen, Union, Hudson, Essex, Middlesex, Somerset, Morris, Passaic, Sussex, Hunterdon, Monmouth, Mercer and Warren Counties.

L. M. Evans has been placed in charge of the new Rochester, N. Y. branch office of Worthington Pump and Machinery Corp., located at 1246 Sibley Tower Building in Rochester.

Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., has begun a quarter-million-dollar expansion of its hose manufacturing facilities to produce high pressure wire braided hose for the United States Air Force, according to J. R. Keach, Quaker's vice-president and general manager.

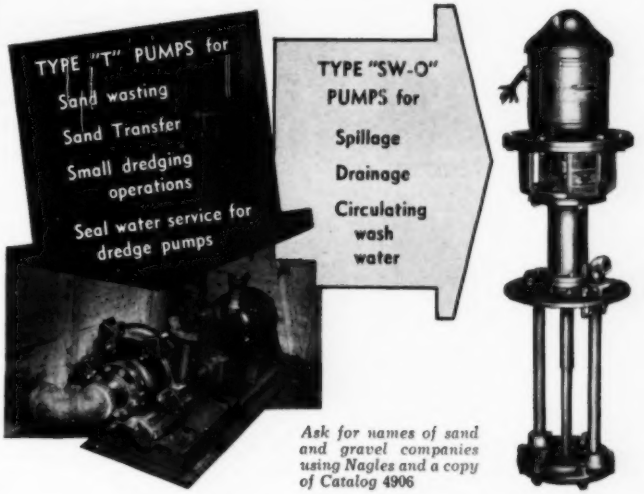
The company has secured the approval of the National Resources Security Board thus assuring prompt completion of the program.

R. W. Sabine

Richard W. Sabine, former senior staffman in charge of mechanical goods advertising and sales promotion for the Goodyear Tire & Rubber Co., Akron, Ohio., has been named manager of distributor sales in the company's mechanical goods division, succeeding W. T. Bell, who died recently.

Mr. Sabine joined Goodyear in 1942 and was assigned to production work in the company's aircraft subsidiary. He was appointed staffman in the company's sales promotion department in 1946 and was promoted to senior staffman in that department in 1950. In his new post, he will handle the company's contacts with distributors of mechanical rubber goods products.

Nagle Pumps for Sand Handling



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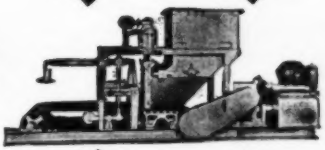

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Legal decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

How to Avoid Legal Pitfalls

During the early part of this year the writer traveled twelve Southern States, and talked personally with numerous readers of Pit and Quarry, as officials and operators of sand and gravel plants, quarries, manufacturers of non-metallic products and many other persons in the non-metallic field. Several important legal questions involving legal pitfalls were presented to the writer who, during succeeding weeks, located higher court cases directly to point. Hence the purpose of this article is presentation of the various legal questions in simplified formulation and supplying answers based upon late and leading higher court decisions for benefit of all readers.

Must Pay Minimum Rentals

Question: "If an operator leases land for a definite period, as ten years, for extraction of sand, gravel or other non-metallic products and before expiration of the lease the materials 'run out' can the operator avoid paying agreed rentals or royalties?"

Answer: According to a late higher court decision, the operator must pay rentals until the expiration of the lease contract unless the lease contains a specified clause to the contrary.

For example, in *Bevin v. Henry Steers Sand & Gravel Company*, 219 N. Y. S. 14, it was shown that a sand and gravel company leased real property for the purpose of extracting sand and gravel from the land. The term of the lease was ten years, at a *minimum* rental of six thousand dollars per year, plus ten cents per cubic yard for all materials removed. The apparent intentions of the parties was that the company should pay at least a minimum rental of six thousand dollars during each year for ten years, by paying at least fifteen hundred dollars each three months. The company's counsel endeavored to protect the company by inserting a clause in the lease contract to the effect that the company could at any time cancel the lease by giving written notice to the owner of the property three months in advance "in the event that extended bed or beds of clay be found upon the leased property within 50 ft. of the natural surface of the ground, upon which bed or beds there is not 12 ft. or more of sand and gravel, with the result that a deposit of sand or gravel of at least 12 ft. in thickness is not available."

The company did not commence excavating the sand and gravel for almost two years after the contract was signed, but paid to the land owner the agreed yearly rental.

During the third year the company removed 29,000 cu. yds. of sand and gravel, and paid the owner of the premises as agreed. At the middle of the seventh year the company had paid the owner of the premises $85,358, in accordance with the terms of the contract. Then the company wrote the owner of the premises explaining that all of the sand and gravel was exhausted, and that it would cancel the lease. After having removed all of its machinery from the property the owner of the property contended that the company owed the minimum rental of $6,000 a year during the *full* 10 year period of the lease, because although the sand and gravel was exhausted no clay beds had been discovered.

The counsel for the company argued that the stipulations in the lease relative to the clay beds were *equivalent* to the exhaustion of the sand and gravel, and further since the total amount paid to the owner of the premises was $85,358, this total amount was more than an average minimum payment of $6,000 per year for the 10 year period of the lease contract.

It is interesting to observe that the higher court held that since the lease did not contain a *specific* clause that the company could cancel the lease if the sand and gravel became exhausted before the expiration of the ten year period, the company must pay a minimum rental of $6,000 per year for the balance of the ten year term. The court said:

"Conceding for the sake of argument all that what defendant (company) says about the general rule that in cases of doubt or uncertainty a written lease is construed in favor of the grantee or leasee, I do not agree that there is any doubt or uncertainty or ambiguity about the agreement in the case at bar. The intention of the parties is gathered from the entire instrument . . . When an instrument is clear and unambiguous, we are not obliged to refer to 'practical construction' by the parties, or the abstruse reasons of learned courts concerning other leases and other agreements differing from that now before us . . . The agreement between the parties, is *not* a contract for the sale of material in place . . . The defendants (company) admit they 'abandoned' the premises on their theory that 'the said premises were totally exhausted of sand and gravel.' The lease contains no provision for cancellation on the ground of exhaustion of sand and gravel . . . The lease of the property was for 10 years, with an absolute covenant to pay a minimum rental of $6,000 per year in each year of the term. If there was any 'exhaustion' of sand and gravel, obviously it was brought about by defendant's excavation of excessive quantities of sand and gravel during the first 6½ years . . . It was only in case extended beds of clay were discovered upon the leased property within 50 ft. of the natural surface of the ground, upon which beds of clay there was not more than 12 ft. of sand and gravel, with the result that a deposit of sand or gravel of at least 12 ft. in thickness was not available, in that case only was the tenant (company) entitled to give three months' notice of intention to cancel the lease. I again assert that the transaction between the parties was not a sale of sand and gravel. It was a 10 year lease of property, with privilege of removing sand and gravel, but with a similar provision for payment of a minimum rental during each of the 10 years, whether the tenant removed material or not."

Of course, if the company had encountered clay beds within 50 ft. of the natural surface and the sand and gravel was not more than 12 ft. deep, the company could have cancelled the lease without any obligation or liability. However, clay beds were not encountered and therefore, the company was obligated to pay the yearly minimum rentals without regard to exhaustion of the sand and gravel.

Motto: Make your lease contracts specific and clearly in your favor. Include a clause to the clear effect that if and when paying quantities of materials are exhausted you can cancel the lease without further obligations or payment of rental.

Negligence Is Remote

Question: "If a trespasser comes upon quarry premises and finds unguarded dynamite, or other explosives, and sustains injuries, is the owner of the quarry liable?"

Answer: Generally speaking, the answer to this question is yes, if the quarry is near a populated area and a child is the trespasser. On the other hand, the answer is no, if the same situation exists with respect to an adult.

For example, in the leading case of *Kennedy v. Independent Quarry & Construction Co.*, 291 S. W. 475, it was shown the Independent Quarry and Construction Co. owned and operated a quarry. There was a wire fence on the one side of the Independent Quarry and Construction Co.'s quarry, and on the other side were buildings used in the operation of the quarry. Among these was a concrete building wherein was kept the explosives used in the blasting operations. There was a pool of water at the bottom to which young men and boys sometimes went for swimming. One Sunday morning a man named Kauffman trespassed on the Independent Quarry and Construction Co.'s property and removed his clothes in a shed and went

into the pool. Upon his return from the pool, and while dressing, he saw lying upon a piece of timber supporting the roof of the shed, a tin box, on which lay a piece of fuse. The tin box was closed, but the lid was not fastened. There was no warning sign upon or about it. When the lid of the box was opened he found therein a number of dynamite caps. The man took out a few of the caps, and put them and the piece of fuse into his pocket.

Some time later the man decided to explode the caps. At about the time he intended to light the fuse, another person named Kennedy came up. The cap immediately exploded, and Kennedy lost the thumb and forefinger of his right hand, and received injuries to his eyes which made him practically blind. Also, the man who found the explosives was seriously injured.

In subsequent litigation the higher court held the Independent Quarry and Construction Co. not liable for injuries to either man, and said:

"It may be stated as a general principle of law that one who has in his possession or under his control an instrumentality dangerous in character, is bound to take exceptional precaution . . . The caps were in a closed box, and his testimony shows he knew he was appropriating something which belonged to another, and which he had no right to take. With him it was not merely the inclination of a child to play with an attractive object coming in his way, but rather a wrongful appropriation, consciously made of things which he had 'no business with'."

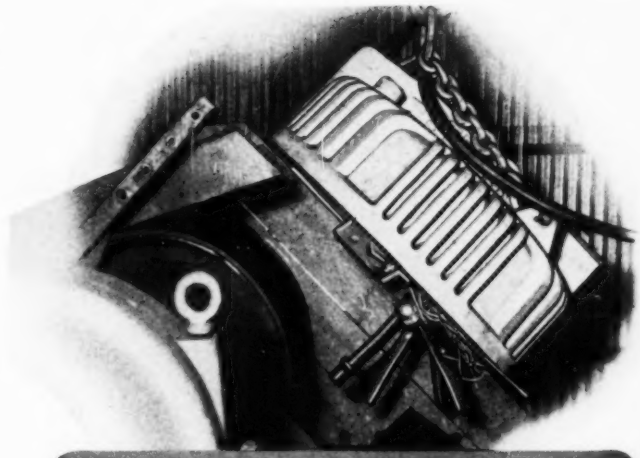
This court also explained the law that the owner of a quarry, or other real property, never is liable in damages for injuries to an adult unless the testimony shows that the adult was injured through *gross* negligence or intentionally by the owner of the property or his employes. On the other hand, the property owner *always* is liable for injuries to children, who are trespassers, if the testimony shows that officials or employes of the quarry knew that children usually trespassed or played on the premises, and the thing that caused the injury was left unguarded or in exposed location.

Employe Is Contributory Negligent

Question: "Is an employer liable in damages for injuries caused to an employe by defective tools?"

Answer: The employer *never* is liable if the testimony shows that the employe used a defective tool when knowing that it was dangerous and that he could have obtained a tool not defective.

For example, in *Watson v. Carthage Marble and White Lime Co.*, 290 S. W. 649, the testimony showed facts as follows: A company was engaged in removing stone from a quarry to a mill, where the stone was sawed into the dimensions desired. The blocks of stone were often 10 or 12 ft. long, from 5 to 7 ft. wide, and 5 or 6 ft. in thickness. The entire block was run in the mill on a truck and sawed while on the truck. Long thin blades or saws without teeth were used to cut the stone, and several



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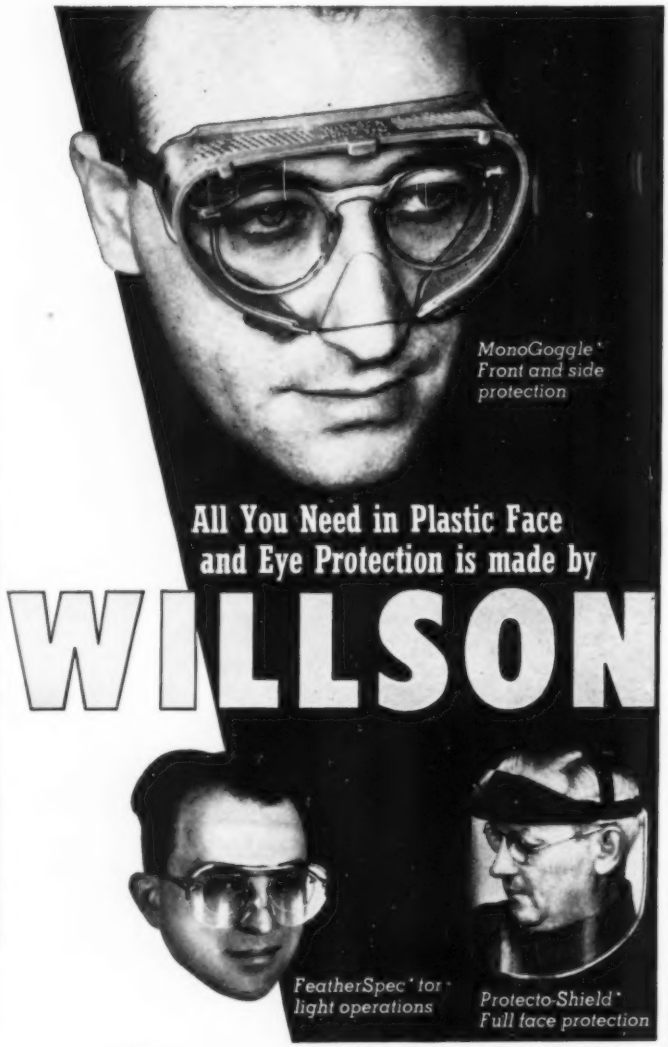

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saws used at the same time upon the same stone. These saws were operated by machinery, and with the aid of sand and water cut the stone. The saws had a hole in each end and a piece of steel, called a dog, was bolted to the ends of the saws and extended back 2 or 3 ft., passing through what is called channel bars. Keys were used to tighten the saws. The foreman usually put the keys in the dog opening at one end and the workman put them in at the other. Upon signal from the foreman, the workman would drive in the key at his end. These keys were made of flat steel and by use would develop a kind of a shoulder on the outer edge. There were a large number of keys in the mill, and the employes had access to all new keys. When a key was worn too much to be proper for use, it was taken to the shop and repaired.

One day a workman placed a worn key in the opening in the dog and, upon receiving a signal from his foreman, began to drive the key with a hammer. The worn key flew out and struck him in the eye, putting out the eye.

The injured employe sued the employer for heavy damages contending that the accident was caused through negligence of the employer in failing to replace the worn key with a new or repaired key.

The lower court held the employer liable, but the higher court reversed the verdict and, in holding the injured employe not entitled to a recovery said that since there were a large number of new and repaired keys available to the employee, the latter contributed to his own injury by using a worn key. This higher court explained in detail the degree of care required of an employer to supply safe tools and machinery to employes. The court said that an employer is not an "insurer" of the safety of his employes, but must exercise "ordinary care" to supply employes a reasonably safe place in which to work and reasonably safe tools and appliances with which to work. The court also said:

"Along with the duty of the employer to use ordinary care for the safety of his employes goes the duty of the employe to use ordinary care for his own safety. He cannot, under all circumstances, blindly rely on the employer and pay no attention to his own safety, but must use his own faculties and his own judgement and knowledge of the facts in taking care of himself."

Must Place Flares

Question: "What can a contractor do to protect himself against damage liability when he is compelled to leave equipment on a highway? Suppose he places red lanterns on the equipment and someone steals them and an automobile collides with the equipment, who is responsible?"

Answer: It is well established law that an automobile driver is required by the law to exercise "ordinary care" to safeguard himself against injury by collision with any object left on a highway, irrespective of negligence of the person who obstructed the highway. However, if the jury decides that the

injured automobile driver exercised ordinary care to prevent the collision, he is entitled to recover damages. So held the higher court in the late case of *Wicker v. North States Construction Co.*, 235 N. W. 630.

The facts of this case are that a contractor negligently left a concrete mixer on a highway without any warning flares. The mixer had considerable dried concrete upon it giving it much the same color as the highway, and tending to destroy its discernibility. The testimony was that the color of the mixer was "of a neutral character such as not to make it conspicuous on the road."

That night an automobile driver when traveling at a normal rate of speed, collided with the mixer and was seriously injured. In subsequent litigation the jury held the company liable in heavy damages and the higher court upheld the verdict, saying:

"The jury was warranted in concluding that the difficulty in the instant case was that the object in the road was about the same color as the road, and was not reasonably discernible under the circumstances until within about 20 ft. therefrom. Indeed there is nothing in the record to indicate that the driver could not have stopped his car within the radius of his lights. In this case it was permissible for the jury to conclude that no automobile light would have reasonably disclosed the obstruction. If so, it would seem to follow that the accident was not due to the driver's conduct or to the character of his lights."

This court also explained that if a contractor or owner of equipment left on a highway, places red lanterns or flares to warn automobile drivers of the danger and someone steals the flares or lanterns, the thief is solely liable for resultant injuries to an automobile driver who collides with the equipment. In other words, the contractor is relieved from liability upon proof that he exercised "ordinary care" and placed flares, or other warnings, on the stalled equipment.

Contractor Breached Contract

Question: "If a property owner inserts in a contractor's contract the kind of materials the contractor must use, is the contractor liable on a guarantee as to the finished work? Suppose a contractor sees that he cannot complete his contract and so informs the property owner, can the latter sue the contractor and receive damages?"

Answer: If a contractor guarantees his work, he is liable for a breach although he used the exact materials specified by the property owner.

For example, in the leading case of *City of McPherson v. Stucker, Stucker & Strachan*, 282 Pac. 703, it was disclosed that a contractor contracted to build a concrete waterproof tower for a city. The contractor guaranteed without reservation that the tower would not leak for one year. The specifications supplied by the city specified a particular kind of waterproofing material. After the work was completed it was discovered that the tower leaked. The contractor refused to repair the leaks. The city officials employed a company to remove the waterproofing material and apply a different material. Then the city filed suit against the contractor for $6,000, the amount expended in repairing the tower.

The contractor contended that he was not liable because he had used *the kind and grade of waterproofing material specified by the city.* Nevertheless, since the contract clearly specified that the contractor guaranteed the tower against leaks for one year, the court held the contractor liable for $6,000, and said:

"The contractor took the position that since the contract specified the character of waterproofing to be used on the tower, and that having been used, he was not liable for the defects in the tower resulting therefrom. . . . Under the contract the contractor had guaranteed a water-tight structure and he was liable to the city *for the breach of that guarantee.*"

In *Clank v. Miller*, 120 So. 475, the higher court held that although a contractor is liable in damages as a result of breaching a contract, yet the mere fact that he states that he *intends* to breach the contract is *not* sufficient justification for the other party to sue and recover damages. This court said:

The mere assertion of a party to a contract that he *will* be unable, or *will* refuse to perform his contract is not sufficient to constitute a breach. There must be a distinct, unequivocable, and absolute refusal to perform, treated and acted upon as such by the other party to the contract. A mere assertion of in-

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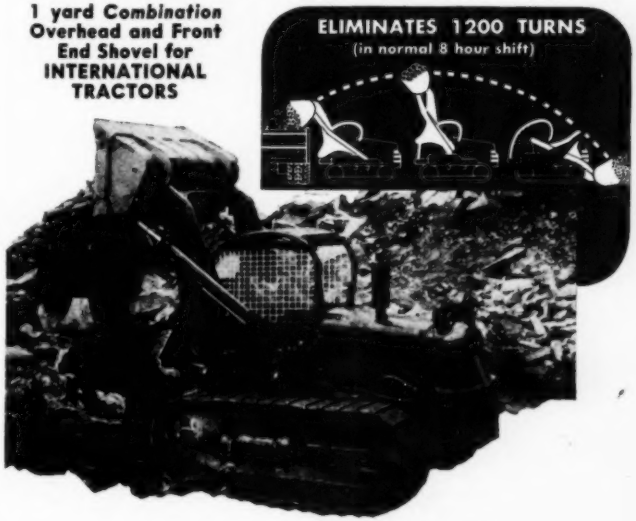

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ability to go on with the contract is not a repudiation of the contract. The intention to abandon the contract at some *future* date is *not* a breach of it unless such intention is declared in positive terms and unconditionally."

traffic news

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 88321 (1)—It is proposed to establish on slag, crude, granulated, crushed or commercial (a product of iron and steel furnaces) in bulk, in open top cars, carload, minimum weight 90 percent of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply from Hamilton, O., to Benton, Ill., 286 cents; South Bend, Ind., 238 cents net ton.

Docket 88324 (2)—Proposed to establish on stone, fluxing, furnace, or foundry, melting and/or refractory (unburned) in bulk in open top cars, carloads, minimum weight is 90 percent of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply from Maple Grove, Narlo, O., to Ashland, Ky., Ironton, Jackson, New Boston, Portsmouth, O., 197 cents per gross ton.

GENERAL FREIGHT TRAFFIC COMMITTEE, EASTERN RAILROADS

Bulletin G-4201 (Shipper)—Proposed to establish on dolomite, roasted (refractory dolomite), in granular form, clinkered or burned to a dead state), carload, minimum weight 90 percent of marked capacity of car, from St. Louis, Mo., to Canonsburg, Pa., $6.26 per net ton, subject to ExParte 175 increase, presently in effect under intermediate application.

Bulletin G-4272 (Carrier)—Proposed to establish on limestone, ground or pulverized, unburnt, carload, minimum weight 60,000 pounds from Marlo and Mosher—Ste. Genevieve, Mo., to Lapel, Ind., $3.08 in open cars and $3.68 in closed cars, per net ton, subject to ExParte 175 increase.

COLORADO-WYOMING COMMITTEE

Docket X-150 (Carrier)—Proposed to establish a rate of $2.00 per ton of 2000 pounds on sand, gravel and crushed stone, carload, minimum weight 90 percent of marked capacity of car from Pueblo to Weston, Colo. Rate not subject to ExParte 162-6-8 increases and applicable only on Colorado intrastate traffic.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-1062—Rock, bituminous asphalt, crude, crushed or ground minimum weight 90 percent of marked weight capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply, from St. Louis, Mo., to Beman, Ill.

Rates in cents per net ton, subject to ExParte 162, 166, 168 and 175 increases:

Present	Proposed
300	240

NORTH PACIFIC COAST FREIGHT BUREAU AND PACIFIC SOUTH-COAST FREIGHT BUREAU —JOINT DOCKET

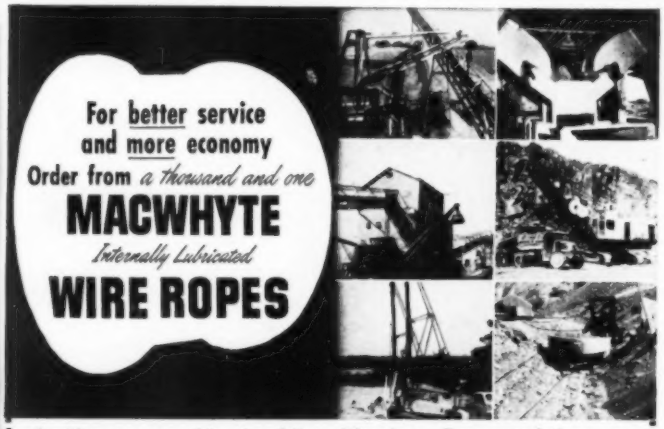
Docket JT 1669 (S)—Crushed rock, including marble chips from Seattle to San Francisco, Cal., 30 cents; Los Angeles 40 cents; San Diego 45 cents, minimum 30 tons, subject to ExParte 175 increase.

Docket JT 1537 (Supplement 1)—Request for rate on crushed rock, including marble chips, carload, from Chewelah, Wash., to San Francisco, Cal., 48 cents; Los Angeles 58 cents; San Diego 63 cents with routing via Seattle, Wash., minimum weight forty tons. Subject to ExParte 175 increase.

Docket JT 1673—Request for through rates based on 60,000 pounds minimum, also 80,000 pounds on limestone in burlap bags of 100 lb. each from Aragonite Spur (Delle), Utah, to Hanford and Richland, Wash.

NORTH PACIFIC COAST FREIGHT BUREAU DOCKETS

Docket NC-1995 (S)—Gypsum, ground, carload from Hanover and Heath, Mont., to stations on Camas Prairie Railroad. Proposal to publish following base rates, subject to ExParte 162, 166, 168, 175.



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Ahsahka, Idaho . . 28 cents—80,000 lbs.
Penoyer, Idaho . . . 31 cents—80,000 lbs.
Greer, Idaho . . . . . 31 cents—80,000 lbs.
Tramway, Idaho . . 40 cents—40,000 lbs.
Tramway, Idaho . . 31 cents—80,000 lbs.
Kamiah, Idaho . . . 32 cents—80,000 lbs.
Kooskia, Idaho . . 32½ cents—80,000 lbs.
Stites, Idaho . . . . 32½ cents—80,000 lbs.

Cancel carload rates to Myrtle account LCL station and to Chapin account non-agency station.

Docket (X) NC-2051 (S)—Request for rate on limestone, carload, from Columbia to Bellingham, Wash., of 4½ cents per hundredweight, subject to ExParte 175 increase, minimum weight, 50 tons.

PACIFIC SOUTHCOAST FREIGHT BUREAU PROPOSALS

Docket (X) 1922 (Shipper)—Request for rate on lime, fluxing, carload, from Bowman, Cal., of 13 cents per hundredweight to Port Chicago, and Pittsburg; 15 cents per hundredweight to San Francisco, Oakland, Niles, Cal., min. 100,000 lb.

Docket 1958 (Shipper)—Request to publish rates per hundredweight on gypsum crude or crushed (not ground) minimum weight 90 percent of marked capacity of car, except when loaded to full visible capacity, actual weight but not less than 80,000 pounds will apply from Gerlach, Nev., to the following California points:

	Open Cars	Closed Cars
Kentucky House	18	20
Davenport	22	23
Redwood City	19	21
Hollister & Permanente	21	22

Docket 1852 (4-28-51)—A rate of 12 cents on limestone was approved, minimum weight 100,000 pounds, except if car is loaded to weight carrying capacity actual weight applies; not less than 80,000 lbs.

WEEKLY DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION PROPOSALS

Docket A 7486 (c)—Proposed to establish on gypsum rock, crude or crushed (not ground) in bulk, carload, 80,000 lbs., Plasterco, Saltville, Va., to Kosmosdale, Ky., $4.40 per net ton in open top cars unprotected and $4.73 per net ton, in closed cars or protected cars, not subject to ExParte 162-6-8.

Docket A 7579 (c)—Proposed to establish on crushed stone, in closed cars, carload, 80,000 pounds to E. St. Louis, Ill., from Whitestone 468 cents; Tate, Ga., 457 cents net ton, not subject to ExParte 162-6-8.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 56599 (1)—Establish rates on lime calcium, that is common lime, hydrated, quick or slaked from Sallisaw, Okla., to Chicago, Ill., Milwaukee, Wis., carloads on the same scale as applicable from competitive points:

	lbs.
To Chicago, Ill. . . .	40c min. weight 30,000
	34c min. weight 50,000
To Milwaukee, Wis. .	41c min. weight 30,000
	34c min. weight 50,000

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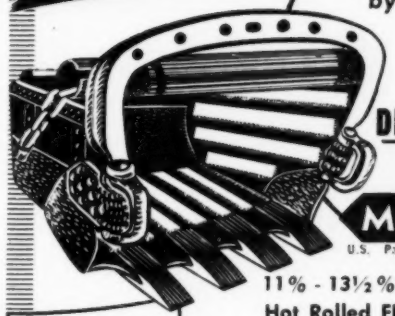

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Medium sized Sauerman Slackline Cableway, installed in 1928, has dug and moved many hundred thousand cubic yards of sand and gravel from this pit to the screening plant with minimum expense and repairs. Still good as new after 22 years' service, the machine continues to maintain its rated capacity.

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SLACKLINE CABLEWAY EXCAVATORS

For greater efficiency and economy on long haul work such as the excavation of materials under water, across deep pit, sludge or bog, the Sauerman Slackline Cableway is your best bet. This versatile machine digs, conveys, elevates and dumps in a rapid, continuous cycle under the control of a single operator. It digs with ease in almost any kind of ground—reaches deep into pits, ponds, gulleys or rivers and moves heaping loads at a rapid rate to a high delivery point. Result: more yardage moved per hour, at less cost per yard. Low initial cost . . . low power consumption, either gasoline, electricity or Diesel. Simple installation and upkeep. Sizes 1/3 to 3½ cu. yd.

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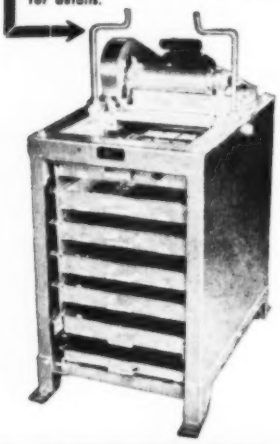
TEST YOUR PRODUCT TODAY

The GILSON Way

Fast, accurate, easy to operate, durable—that's the GILSON Mechanical Testing Screen for test-sizing samples of gravel, crushed stone, and similar materials. A GILSON Screen eliminates guesswork, and helps to insure a uniform product. Write for details.



GILSON SCREEN CO.
BOX 186 MERCER, PA.

Not subject to Tariffs X-162-B, X-166-C or X-168-A.

Docket 56750 (2)—Lime, Sallisaw, Okla. (Group 30), to Anadarko, Okla. Establish rate of 31 cents, not subject to ExParte 162 and 166 increases on lime, carloads, as described in Item 20, Southwestern Line Tariff 227-E from Sallisaw, Okla., to Anadarko, Okla.

Docket 56980—Emergency (1) sand, gravel and crushed stone, Pueblo, Colo., to Raton, N. M., re-establish rate of $1.85 per net ton not subject to X-162 and X-166 increases.

TEXAS-LOUISIANA FREIGHT BUREAU

Docket 11712-TX—Crushed limestone for fluxing purposes in manufacture of iron and steel articles from Gandy to Houston. Shipper's proposal to establish rate of 118 cents per ton of 2000 pounds, not subject to X-162, X-166 or X-168 increases, from Gandy to Houston, Tex., on crushed limestone to be used for fluxing purposes in the manufacture of iron and steel articles. Rate proposed is made on same basis as rates from other origins to Houston for same purpose.

FREIGHT TRAFFIC COMMITTEE TRUNK LINE TERRITORY RAILROADS

Docket TL M-1410 (Shipper)—Proposed to establish on crushed stone, carload, minimum weight 90 percent of marked capacity of car, from Bittinger, Pa., to Atco, Grenlock, Glassboro, Swedesboro, N. J., Mt. Holly, N. Y., $2.31 and Highstown, N. J., $2.48 per gross ton, subject to ExParte 175 increase.

Docket TL M-1436 (Carrier)—Proposed to establish on lime, agricultural, in bulk, or in packages as provided in Consolidated Classification, carload minimum weight 50,000 pounds from Kimballton to Hopewell, Va., $3.85 per net ton, subject to ExParte 175 increase.

Docket TL M-1441 (Shipper)—Proposed to establish on crushed stone in open top cars, not protected by tarpaulin or other protective covering, carload minimum weight 90 percent of marked capacity of car, from Oaks Corners to Horseheads, N. Y., $1.40 per net ton, subject to ExParte 175 increase, in lieu of $1.60.

Docket TL M-1460 (Shipper)—Crushed stone, in open top equipment, not protected, carload minimum weight 90 percent of marked capacity of car, from Bittinger, Pa., to the following Pennsylvania points:

	Per Net Ton
Harrisburg	$1.83
Rutherford, Beaver Creek, Hummelstown, Brownstone, Swatara, Hershey, Palmyra, Annville, Cleona, Lebanon	1.95
Avon, Prescot, Myerstown and Richland	2.07

Subject to ExParte 175 increase.

FREIGHT TRAFFIC COMMITTEE TRUNK LINE TERRITORY RAILROADS

Docket TL M-1485 (Shipper)—Proposed to establish on stone, fluxing, carload, minimum weight 80,000 pounds from Watertown to Syracuse, N. Y., $1.74 in open cars, $1.87 in closed cars and Utica, N. Y., $1.79 in open cars and $1.96 in closed cars, per gross ton, subject to ExParte 175 increase.

Docket TL M-1506 (Shipper)—Proposed to establish on limestone, crude, fluxing, foundry or furnace, in open top equipment, carload minimum weight 90 percent of marked capacity of car from Bellefonte, Pleasant Gap and Chemical, Pa., to Ithaca, N. Y., $3.25 per gross ton, subject to ExParte 175 increase, in lieu of 40 cents per 100 pounds.

WESTERN TRUNK LINE NEW APPLICATIONS

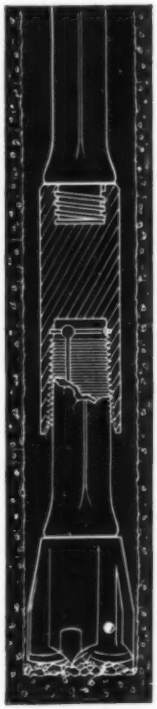
Docket E-41-1413 (Shipper)—Crushed rock (crushed stone) carload minimum weight 90 percent of marked capacity of car, except when weight of shipment loaded to full visible capacity of car is less than 90 percent of marked capacity of car, the actual weight will apply. In no case shall the minimum weight be less than 40,000 pounds. From Sioux Falls, Dell Rapids and Spencer, S. D., to Niobrara, Neb. Proposed $2.65 per ton, in open cars, including ExParte 162-166-168 increases, subject to ExParte 175.

Docket X-E-41-1415 (Shipper)—Stone, crushed, pulverized or ground. Minimum weight 90 percent of marked capacity of car, except when actual weight of shipment loaded to full visible capacity of car is less than 90 percent of marked capacity of car the actual weight will be the minimum weight but in no case less than 40,000 pounds per car, from Duluth, Minn., to Merrimac, Wis. Proposed 7½ cents per 100 pounds, subject to ExParte

ONLY ROCK BIT OFFERS THIS...

hole saving fishing tool

The Rock Bit outside fishing sleeve is attached to conventional steel threaded for Rock Bit R-1 or R-2 or Timken H or D steel. The tool threads itself securely onto the broken steel, making extraction easy. R-1 or H threaded Hole-Saver will extract ⅞", 1" and 1⅛" Hex. or Q. O. —R-2 or D will extract 1⅛" or 1¼" Rd. to save both bit and hole. It pays for itself. Request folder. Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa. *Branch:* 350 Depot St., Asheville, N. C.



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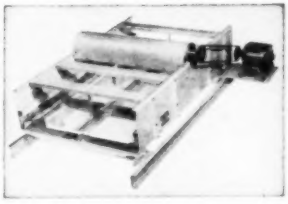
SALES AND SERVICE CO.

UNIVERSAL IS YOUR BEST BET IN SAND & GRAVEL OPERATIONS!

High-speed, elliptical vibration handles these materials with ease!



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RACINE, WISCONSIN

162-166-168-175 increases.

Docket D-25-300—Proposed to establish on lime, common, that is lump, crushed, pulverized or hydrated, in straight or mixed carloads.

	Present	Proposed
From Green Bay, Wis., and Menominee, Mich., to Appleton, Kimberly, Neenah, Menasha, Wis.	5½	6½
From Menominee, Mich., to Nekoosa and Wisconsin Rapids, Wis.	—	10

Rates in cents per 100 pounds. Cancel permitting rates subject to 30,000 and 50,000 pounds minima to apply.

Docket E-41-1417 (Shipper)—Proposed to establish on crushed stone, carloads, in closed cars, minimum weight 90 percent of marked capacity of car, except that when weight of shipment loaded to full visible capacity of car is less than 90 percent of marked capacity of car, the actual weight will apply but not less than 40,000 pounds from Sussex, Wis., to Moorhead, Minn., and Fargo, N. D. Proposed $5.00 per net ton, inclusive of X-162-6-8 increases and subject to X-175 increase.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket X-E-41-1418 (Shipper)—proposed to establish on crushed stone, in open cars, minimum weight 90 percent of the marked capacity of car except that when actual weight of shipment loaded to full visible capacity is less than 90 percent of the marked capacity of car, the actual weight will apply, but in no case shall the minimum weight be less than 40,000 pounds from Waukesha to Burke, Wis.

Proposed—95 cents per net ton, subject to ExParte 175 increase.

Docket D-25-302 (Shipper)—Lime, that is lump, crushed, pulverized or hydrated, in straight or mixed carloads. Proposed to establish through one-factor rates from Mosher-Ste. Genevieve, Mo., and other producing points to western trunk line destinations in western Minn., North and South Dakota, on basis of the so-called Scale B, minimum 30,000 pounds; rates 80 percent thereof minimum 50,000 pounds.

Docket X-E-41-1432 (Shipper)—Sand, gravel and crushed stone, carload minimum weight marked capacity of car from Pueblo, Colo., to Raton, N. M. Proposed to re-establish on permanent basis carload rate of $1.85 per net ton, not subject to X-162 and X-166 increases formerly carried in Item 2380-C, Supplement 114, AT&SF Tariff 5896-Q ICC 14346, on temporary basis, also cancel carload rate of 8 cents per hundredweight, subject to all increases account proposed rate lower.

Docket X-E-41-1432 (Shipper)—Proposed to establish on sand, gravel and crushed stone, carload, minimum weight marked capacity of car from Pueblo, Colo., to Raton, N. M. Re-establish on permanent basis carload rate of $1.85 per net ton not subject to X-162 and X-166 increases formerly carried in Item 2380-C, Supplement 114, AT&SF Tariff 5896-Q ICC 14346, on temporary basis. Also cancel carload rate of 8 cents per hundredweight subject to all increases account proposed rate lower.

K-P *Engineered*

WIRE SCREENS

* **SIEVING**
* **SIZING**
* **SEPARATING**

Korb-Pettit Wire Screens are not only first quality in material and workmanship but are engineered for the job involved. Available in High Carbon Spring Steel and Oil Tempered Spring Steel for extreme abrasion resistance. Designed for all types of vibrators and rotary equipment.

Wire Screens,
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Special Purpose
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designed & manufactured
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ASK FOR HANDBOOK NO. 36

for DRILLING POWER and UNLIMITED VERSATILITY

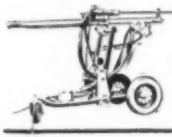
you can't beat this New
FM-3 WAGON DRILL

Most construction and mining men are familiar with the famous X-71 WD Rock Drill. Its drilling speed and hole cleaning ability on deep holes are recognized wherever Wagon Drills are used. It is the only drill made especially for Wagon Drill service.

To permit even further utilization of the power and reliability of this drill, we introduce a brand new mounting known as the FM-3. It incorporates a new type of lifting mechanism and a rugged yoke that permits easy drilling in any position encountered in modern rock excavation.

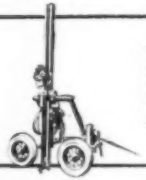
Notice how the swivel wheels are turned and how the drill extends beyond wheels for line hole work against a face.

And how low the yoke can be lowered for efficient toe hole drilling.

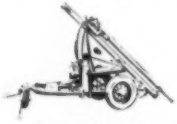


Or how, by a handy crank actuating a powerful worm gear arrangement, the yoke and drill can be easily raised to highest drilling position.

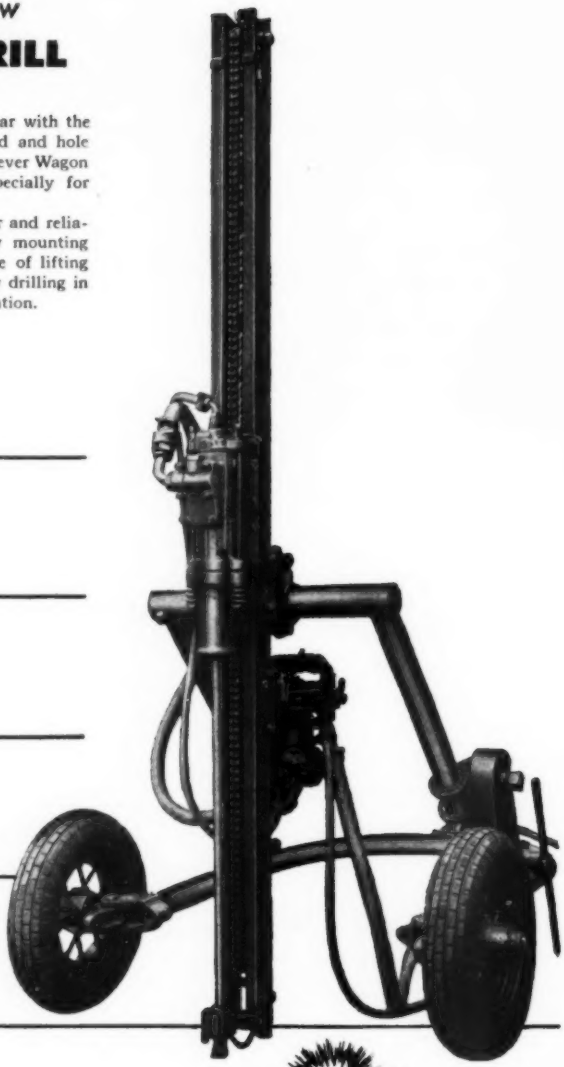
Here's an exceptionally stable and easily moved set up for drilling hole after hole along a face.



What could be more convenient for line hole work? It takes but a minute to swing the swivel mounted wheels through a 90 degree angle.



And for steeper angle drilling, here's another easy set up. All controls are at the operator's fingertips.



Remember Ingersoll-Rand Drills are sold and serviced by men who know rock drilling. Take advantage of this highly trained and skilled service. There is an Ingersoll-Rand branch office and distributor near you. Write or call today.

Ad 596-5

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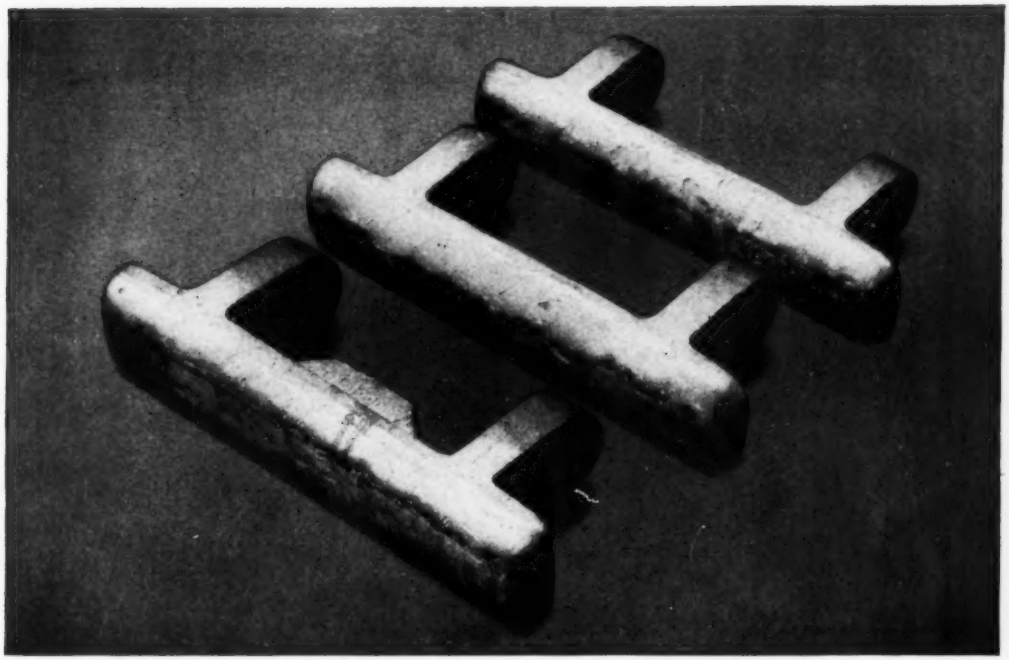


LIMESTONE TONNAGE INCREASED 5 TIMES
by Rebuilding Mill Hammers with Coast Metals Hard-Facing

CM-115 hard-facing welding rod increases hammer life 5 to 1 at 1/3 their cost

These three saddle type reversible manganese steel hammers are used in an Eagle Hammer Mill at the Tarbox McCall Stone Company, Findlay, Ohio to crush dolomitic limestone. Production capacity of this mill is 35 tons per hour. The hammers illustrated have just been removed from the mill for their fourth refacing.

Prior to hard-facing with CM-115, a new set of hammers, costing $23.50 each, produced a total of 1,200 tons of stone. This was accomplished by using both sides of the reversible faces. The average grinding efficiency of the rapidly wearing hammers was calculated at 20 tons per hour.

This set of worn hammers was rebuilt with 5½ lbs. of Coast Metals 115 hard-facing welding rod at a total cost of $20.05, including material, welding costs and installation. Hard-facing was applied to one edge of the hammers only.

They were returned to service and produced 6,000 tons of stone at full capacity of 35 tons per hour. This performance is repeated an indefinite number of times, and with each hard-facing, the rebuilt hammers produce 5 times the tonnage at less than ⅓ the cost.

Holding down production and maintenance costs has never been so important as it is today. So don't *replace—reface* with CM specialized welding rods. You'll not only keep production running smoothly, but save money. We shall be glad to make recommendations based upon your particular needs.

COAST METALS, Inc.

Little Ferry, N. J.

PRODUCERS OF SPECIAL HARD-FACING ALLOYS FOR THE ROCK PRODUCTS INDUSTRY

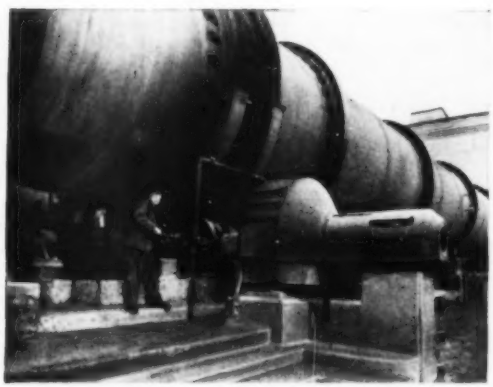
CONTROL BURNING

Modernize electrically with adjustable-speed drives to more accurately co-ordinate kiln rotation and rate of kiln feed for higher quality and greater cement output!

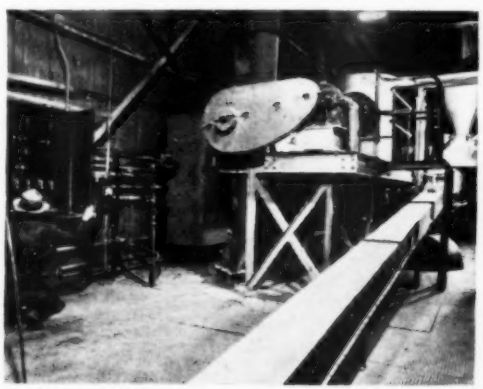
It's a "must" for cement mills today. For maximum cement production and uniformity, all phases of the burning process—kiln rotation and kiln feed—should be closely synchronized and fuel feed precisely controlled.

The right drive to fit your requirements. That's why many cement mills are installing modern General Electric adjustable-speed drives that provide accurate, easily-regulated speed control and close speed co-ordination of kiln feeder and kiln. Available in many types, they include the well-known d-c adjustable-voltage system.

Save time, effort, worry! Moreover, to simplify and hasten modernization of *your* mill, General Electric can co-ordinate the selection, manufacture, and delivery of all the G-E equipment, saving you and your staff time, effort and worry—and assuring you a reliable, integrated electrical system. And whether you order individual motors and control, or all the electric equipment needed for a completely modernized department, you get the help of an experienced G-E representative. Call your nearest G-E office today! *General Electric Co., Schenectady 5, N. Y.*



2 Here is a close-up of one of the G-E kiln motors coupled to a transmitter (both under weather covers). Selsyn transmitter—rated 10 hp, 440 volts, speed range 750/375—actuates selsyn receiver in kiln feed house to co-ordinate kiln feed and kiln rotation.



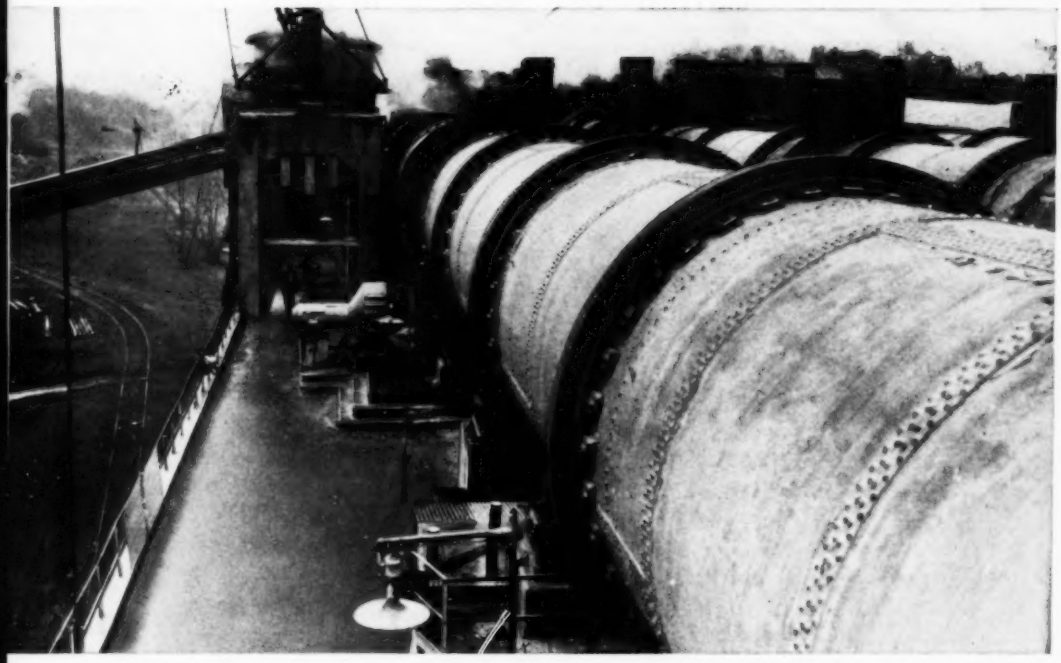
3 In the kiln feed house, feeder units consist of three 31-tons-per-hour feeder screws. The selsyn-receiver controller, similar in construction and rating to the selsyn transmitter, regulates the speed of the kiln feeder screws to correspond to that of the kiln.

You can put your confidence in—

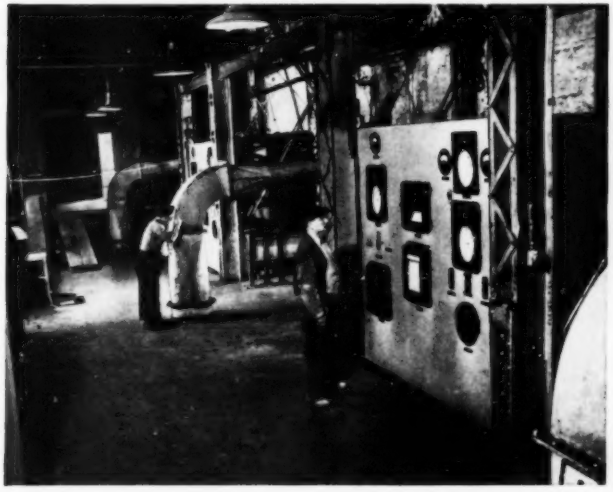
GENERAL ELECTRIC

658-6

MORE ACCURATELY



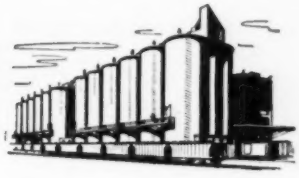
1 **In this large Eastern cement plant** using the dry process, three kilns, 233 feet long, 12 feet in diameter, are driven by G-E adjustable varying speed motors rated 125 hp, 550 volts, 25 cycles, 750/375 rpm, equipped with selsyn transmitters electrically connected to feeder units.



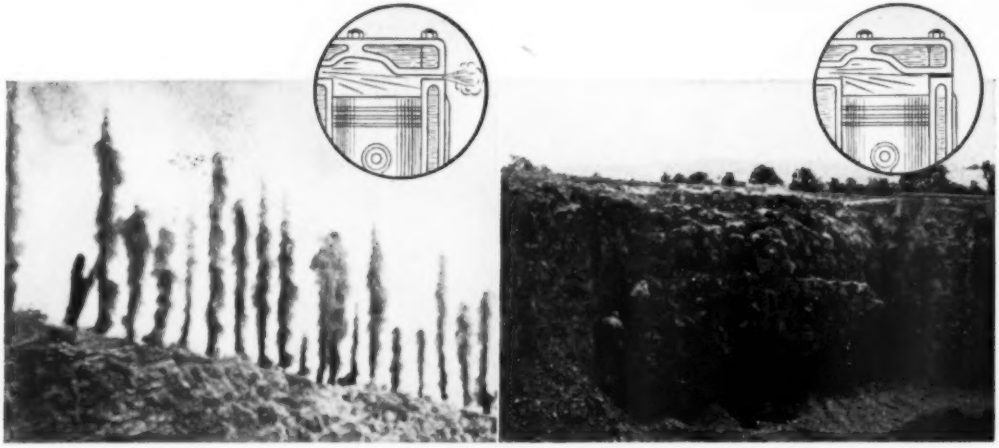
4 **Control of the entire burning process** is centralized on the burner's deck shown here. A panel for each of the three kilns incorporates all the indicating and recording instruments to enable the burner to accurately control the entire clinker-burning process.

Where can *you* profit by electrical modernization?

Kiln operation is only one of several cement-plant processes that offer opportunities today for increased efficiency through electrical modernization. Whatever department *you're* going to modernize—from quarry to packhouse—your best bet for a smooth-working installation is to talk it over with your G-E representative. Call him in at an early stage in your planning!



Power Wasted! Power Working!



Like a "blown" gasket, an ordinary blast wastes the power that **ROCKMASTER** *blasting keeps on the job!*

THE HAMMER, hiss, and whistle of a "blown" gasket means a lot of power is going to waste instead of working on the piston. In the same way, the objectionable noise that often comes from blasting usually means that explosives power is being wasted instead of working on the rock. And that wasted gas is often visible as "geysers" of smoke or wild flying rock.

ROCKMASTER blasting keeps blasting power—the explosives gas—well confined and working on the rock. ROCKMASTER blasting gives a smooth flow of power that means control over breakage and throw never before possible—with far less noise and vibration!

Your job may call for two, three, or even all sixteen ROCKMASTER milli-second delay electric blasting caps. We help you select them to fit a particular job in quarry, strip pit, mine, construction . . . on the surface or underground. Drill pattern is adjusted to fit the system, often with substantial savings in drilling and dynamite.

Write for free ROCKMASTER "16" booklet which includes diagrams for typical loadings. And remember that our technicians will be glad to assist you in applying ROCKMASTER to your operations.

ROCKMASTER: Reg. U. S. Pat. Off.

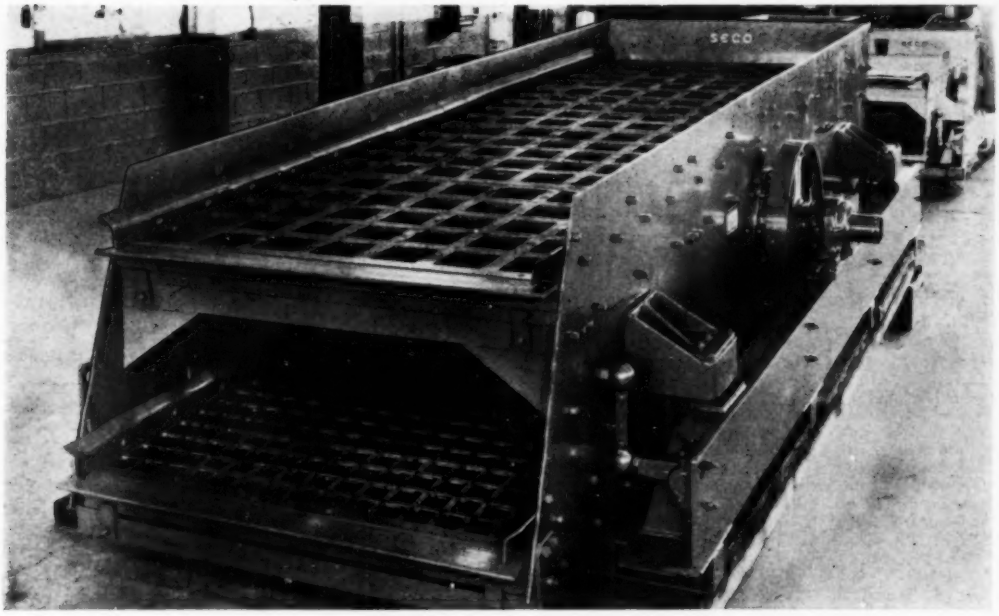
ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Another SECO "WORKHORSE"

On the Way to WATERS CONSTRUCTION CO., Elizabethtown, Ky.



FAST GROWING STONE CRUSHING COMPANY AGAIN CHOOSES SECO VIBRATING SCREENS AS RESULT OF ON THE JOB PERFORMANCE

After *all* it's performance that counts. That's why Waters Construction Company of Elizabethtown, Ky. unhesitatingly chose this big 5′ x 14′ Seco double deck screen to help meet the ever increasing demands for their crushed stone products.

They know that it pays to produce clean, accurately sized products. And they've found from experience that their smooth operating Seco screens meet their requirements by accurately sizing top tonnages . . . with little or no maintenance . . . month after month . . . year after year. Dependable, performance-proven Seco vibrating screens belong on your job, too!

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

LOW COST SCREENING!

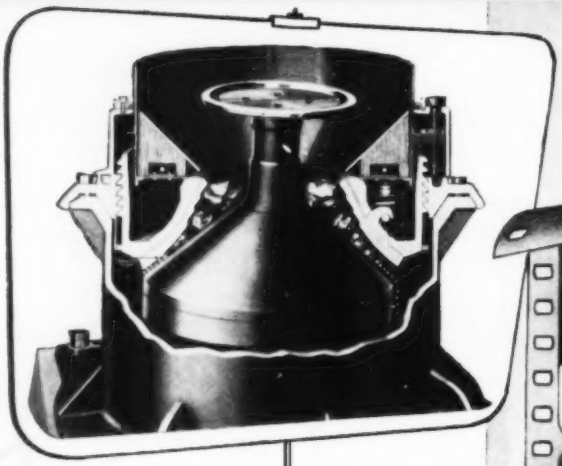
You can turn out greater tonnages of accurately sized materials with the right Seco vibrating screen on your job. And you can do this for pennies per ton . . . thanks to SECO'S long-life and trouble-free performance.

MODERNIZE NOW!

Send for SECO Catalog #203 and the name of your nearest SECO dealer.

SCREEN EQUIPMENT CO., INC.
1750 Walden Ave. Buffalo 25, N. Y.

In Canada
United Steel Corp., Toronto, Ontario



"The SYMONS PROCESS of CRUSHING"

as revealed by the camera

'Tis said that "the proof of the pudding is in the eating." The proof in a Crusher, however, is in its ability to continually produce large quantities of desired product economically. That such has been proven by the SYMONS CONE CRUSHER is evidenced by the thousands of Standard and Short Head SYMONS CONES which have been installed throughout the world wherever fine reduction crushing is being done.

The enormous capacity of the SYMONS CONE CRUSHER is made possible by the remarkably simple SYMONS PROCESS OF CRUSHING which is revealed in the accompanying views through the camera's eye. To record the film, a Standard type CONE CRUSHER was sectionalized to expose the crushing cavity.

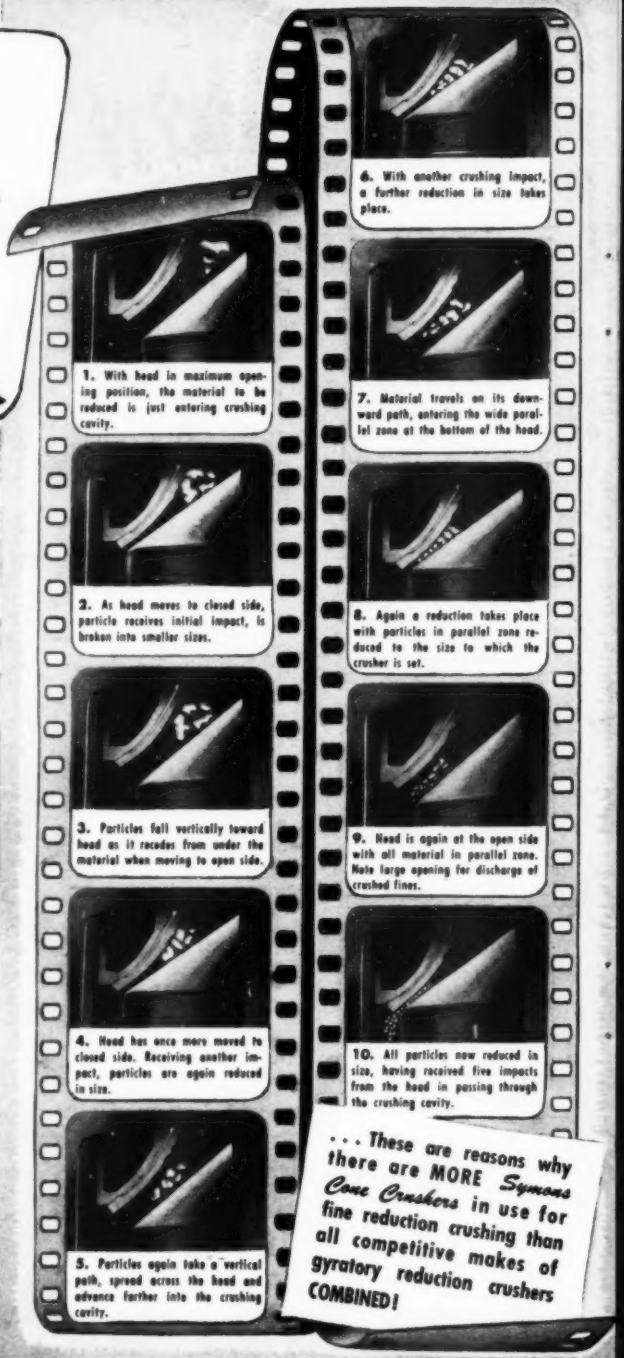
Although the SYMONS CONE is classified as of the "gyratory" type, the principle of crushing differs radically from that of the conventional gyratory since the head or cone in the SYMONS CRUSHER travels at least five times as far and gyrates much faster than in the ordinary gyratory type of crusher.

The material, in its passage through the crushing cavity in the SYMONS CONE, is controlled and timed to receive a series of rapid hammer-like blows before it is discharged.

The crushing action in the SYMONS CONE is a combination of controlled feed, high speed, timing, and extraordinarily large discharge capacity. These factors, coupled with the spring release safety feature of being able to pass uncrushable items—such as tramp iron, etc.—constitute ample proof of the superiority of the SYMONS CONE and the SYMONS PROCESS OF CRUSHING.

The camera reveals that from the time the material enters the crushing cavity until it is discharged, it passes through a successive series of crushing stages with a minimum of abrasion, sliding, or frictional wear—the entire process being one of smashing impact, resulting in maximum reduction.

C151


1. With head in maximum opening position, the material to be reduced is just entering crushing cavity.
2. As head moves to closed side, particle receives initial impact, is broken into smaller sizes.
3. Particles fall vertically toward head as it recedes from under the material when moving to open side.
4. Head has once more moved to closed side. Receiving another impact, particles are again reduced in size.
5. Particles again take a vertical path, spread across the head and advance further into the crushing cavity.
6. With another crushing impact, a further reduction in size takes place.
7. Material travels on its downward path, entering the wide parallel zone at the bottom of the head.
8. Again a reduction takes place with particles in parallel zone reduced to the size to which the crusher is set.
9. Head is again at the open side with all material in parallel zone. Note large opening for discharge of crushed fines.
10. All particles now reduced in size, having received five impacts from the head in passing through the crushing cavity.

. . . These are reasons why there are MORE *Symons Cone Crushers* in use for fine reduction crushing than all competitive makes of gyratory reduction crushers COMBINED!

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK • SAN FRANCISCO • WASHINGTON • SPOKANE
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Machinery for processing ores and industrial minerals

Republic Tips

get to the men who buy and use the hose you sell

save hose users time and money

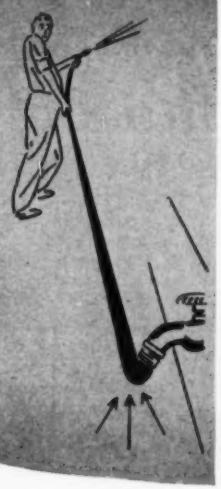
● Makes no difference whether you're using Water Hose, Steam Hose, Air Hose or all three . . . these Republic Rubber hose application tips help you get more efficiency and longer uninterrupted service at less cost.

What's more, your local Republic Rubber Distributor can show you many additional ways to save money through proper selection and use of Hose, Belting, Packing and other products of Industrial Rubber.

He's an expert in his field, representing Republic Rubber, *the* recognized specialist in the field of Industrial Rubber. Contact him today or write direct for a free, but thorough analysis of your requirements.

Never kink a hose to stop flow. Use shut-off nozzle for this purpose or, better still, close valve at connection end. The latter is a must for steam and high pressure fluid hose.

Do not subject hose to stretching or to continual use at right angles to your wall connections. Such treatment will eventually fracture the tube, causing premature hose failure.



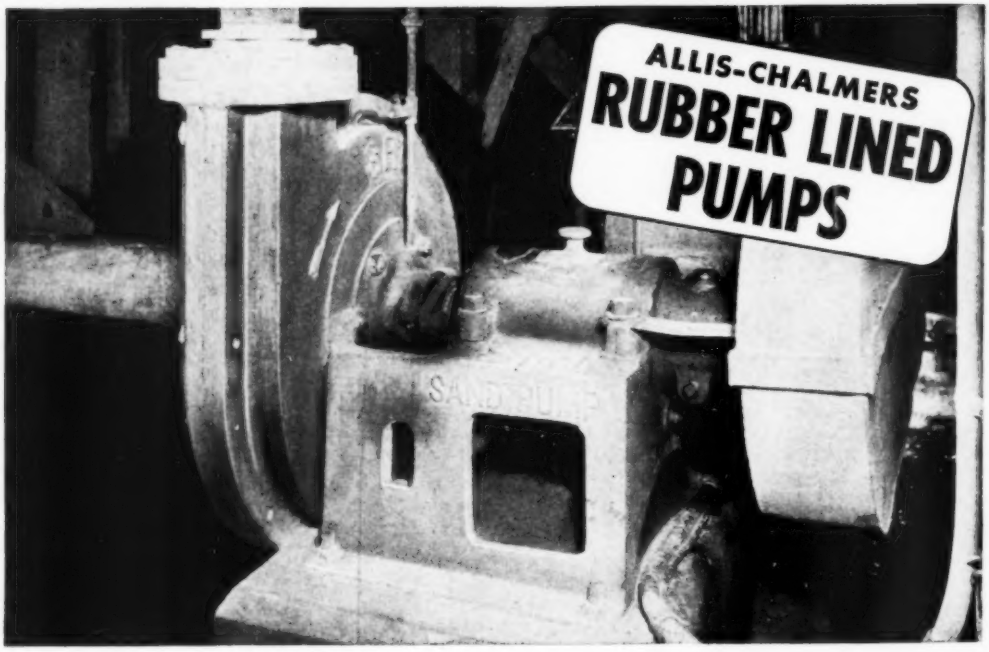
REPUBLIC'S FAIRWAY WATER HOSE
LASTS LONGER, OPERATES MORE EFFICIENTLY, *COST LESS TO USE!!!*

Send water down the smooth bore of Fairway Hose and you get the most economical delivery service possible.

Fairway is a braided hose, built of top quality materials. It is extremely flexible and easy to handle. High tensile strength, rubber-impregnated, fabric carcasses stand up under high, surging pressures while the tough outer cover resists abrasion, cutting and weathering.

All standard sizes are available in 50 ft., 100 ft. or longer production lengths, supplied on reels or in bales.

INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO



Gives You 4 Big Economies In Handling Fine Mesh Materials

1. **Long Life** — Rubber compounds especially made for each application provide from 10 to 50 times the wear resistance of the hardest metals on such jobs as pumping tailings, classifier overflow, grinding mill discharge and other operations involving hard, abrasive materials of ⅛" to 325 mesh size.
2. **Easy Servicing** — The rubber casing liner is completely separate from the casing. It may be removed and replaced without moving the pump itself. The impeller is screwed onto the shaft and also may be removed easily. Thus, a complete supply of spare parts may be kept on hand at moderate cost. Neither standby pumps nor long shutdowns for pump rehabilitation are required.
3. **Flexibility In Operation** — The Allis-Chalmers Rubber Lined Pump is usually driven by a *Texrope* V-belt drive. Its head and capacity may be varied considerably by simply changing the speed of the drive. Where changes are frequent, the *Vari-Pitch* Automatic sheave provides instant speed control at very moderate cost.
4. **Application Engineering** — Each job is individually engineered by a competent Allis-Chalmers application engineer who is familiar with solids pumping problems. You can be sure of exactly the right pump and exactly the right materials for lowest cost per ton pumped.

Get full details on what the Allis-Chalmers Rubber Lined Pump can do for you. Call your A-C District Office or write Allis-Chalmers, Milwaukee 1, Wisconsin, and ask for Bulletin 08B7311. A-3347

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

August 1951

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY

4 months... Over 40, Enthusiastic New Owners!

STEARNS ZIPPER

The machine for the small concrete block plant!

PRODUCES BEAUTIFUL, COMPACT, VIBRATED, PRESSED-TOP BLOCK of Stearns 15 Quality *at a nominal cost!*

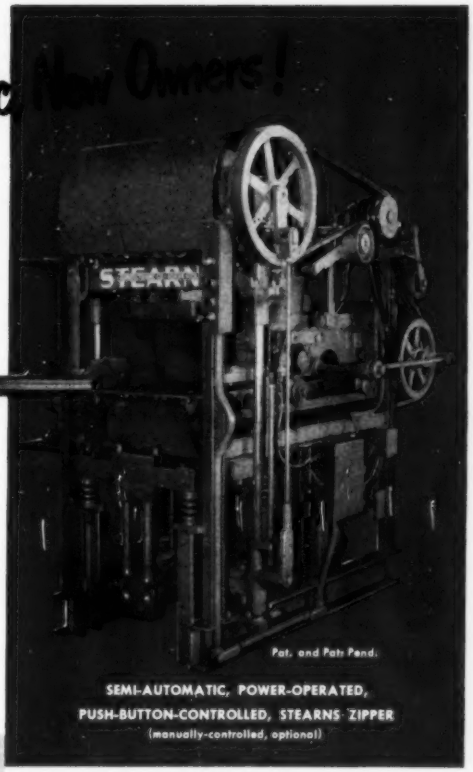
EXTRA LOW PRICE—NO FURTHER INVESTMENT!—Use your present allied equipment—mixer, skip, pallets, racks, etc.

ONE 8", 10" or 12" BLOCK (or equivalent) per cycle. Cored pallets.

GUTS AND STAMINA!—SIMPLIFIED CONSTRUCTION.—The most rugged, trouble-free, compact, small (6'x4'x6') machine ever placed on the market! Every part, easily accessible. Wt.—4100 lbs.

ONE-MAN OPERATION

ONE DEMONSTRATION SELLS IT!—Easily installed.



Pat. and Pats Pend.

SEMI-AUTOMATIC, POWER-OPERATED, PUSH-BUTTON-CONTROLLED, STEARNS ZIPPER
(manually-controlled, optional)

YOU BE THE JUDGE!

Between March 1 and July 1 of this year, Stearns sales of the world-beating Zipper by live demonstration in operating plants snowballed upward to more than 40 in 17 states—north, south, east and west! By now, there is probably a Stearns Zipper in your own city, or, at any rate, close enough for you to *judge for yourself*. Call, wire or write today for location of the Zipper nearest you—FOR YOUR OWN FUTURE PROFIT!

MODERNIZE WITH A STEARNS! BACKED BY MORE THAN A QUARTER-CENTURY OF KNOW-HOW!

STEARNS

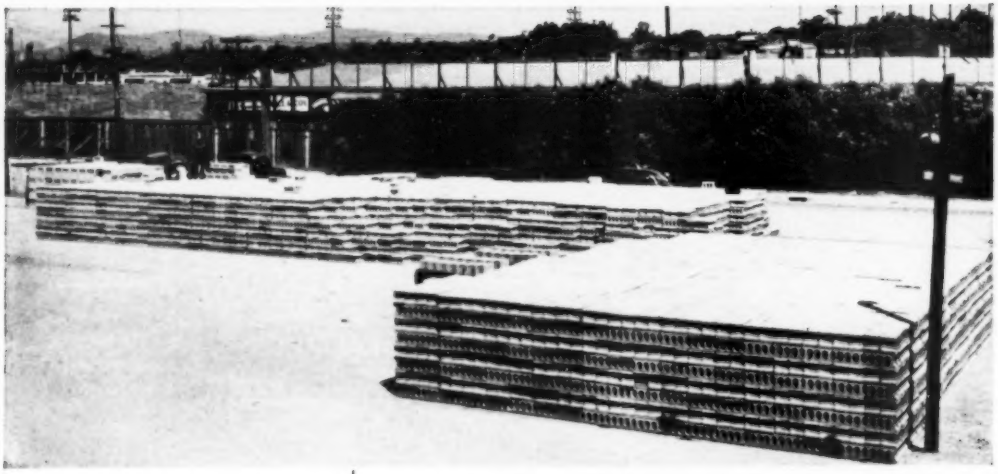
MANUFACTURING COMPANY • INC

ADRIAN • MICHIGAN

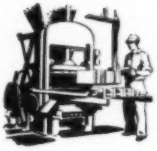
STEARNS 15 STEARNS 50 ZIPPERS JOLTCRETES MIXERS SKIP LOADERS TURNTABLES SINTERLITE

ANNUAL BUYERS' GUIDE ISSUE

Machinery and Supply Directory



Makes superior concrete products



Plants using Duraplastic have found it reduces costs because there is less breakage in handling green products. There are fewer culls and throwbacks. With Duraplastic, edges and corners are cleaner and truer. Face texture is richer, especially when harsh aggregates are used. And users report increased resistance to passage of water through finished products.

Feeds easily through machine

A damper mix may be used with Duraplastic air-entraining portland cement. Manufacturers find that this damper mix is "rubbery" and more cohesive. It stays together better, feeds easily through machines. Duraplastic is the ideal cement for concrete block, brick, pipe, drain tile, silo staves and other machine-made products.

YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

**"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

Makes Superior Concrete Products at No Extra Cost

NBC SUMMER SYMPHONY CONCERTS—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—June to September*

PQ-D-126

NEWS OF CONCRETE MANUFACTURERS

New Ready-Mix Plant Opened in South Dakota By Sand-Gravel Firm

A pioneer sand-and-gravel producer and contractor for many years, the Cole Construction Company, Spearfish, S. D., recently went into the ready-mixed concrete business. New batch-plant facilities are served by a fleet of four new Champion 3- and 4-cu. yd. truck mixers mounted on Ford and GMC chassis. The mixers were designed and built by the Concrete Equipment Mfg. Co. of South Gate, Calif.

Besides Spearfish proper, the concern is delivering concrete to several smaller rural communities within a 20-mi. radius of the plant.

Burned-Out Concrete Firm Incorporates to Rebuild

Hudson River Concrete Products, whose main plant at New Baltimore, N. Y., was destroyed by a $25,000 fire last February, has formed a corporation under the same name and has begun a re-building and expansion program.

Harry B. Rezzemini, vice-president of the company, said construction has been started on a new 80-by-100 ft. building for the manufacture of concrete blocks. The cost of building and equipment will be about $75,000.

Perma-Stone Franchise Granted Shreveport Firm

The Perma-Stone franchise for North Louisiana has been granted to the Perma-Stone Shreveport Co., 2109 Market St., Shreveport, La. James F. Durham, formerly of Shreveport, who has been the Perma-Stone dealer in Beaumont, Tex., is the owner and operator of the company. E. L. Brown of Oklahoma City, Okla., will supervise the application of the stone for the local firm.

Concrete Group Forms Board to Improve Reinforced Concrete

Improvement of reinforced concrete is the aim of the Concrete Industry Board of New York. It will work with other trade associations to improve workmanship and prevent laxity in meeting design specifications for this type of construction.

Roger H. Corbetta was elected chairman of the board of directors, John F. Hall, Portland Cement Association, was named secretary, and Dugald J. Cameron, Fireproof Products Corporation, was elected treasurer. Others directors will be selected by the affiliated groups—New York Chapter, American Institute of Architects; Metropolitan Section, American Society of Civil Engineers; Concrete Reinforcing Steel Society; American Concrete Institute; Portland Cement manufacturers; testing laboratories; and ready-mix concrete producers.

The Texas Concrete Pipe Manufacturers held a two-day meeting the last week in June in the Frontier Hotel, McAllen, Tex. Three plants of members in the Rio Grande Valley were visited, and an entertaining excursion into Mexico as guests of these members was enjoyed. About 45 persons attended the meeting.

• At the 27th anniversary meeting of the Concrete Reinforcing Steel Institute held at The Homestead, Hot Springs, Va., Carl A. Menzel (left) of the Portland Cement Association received the 1951 Award of the Institute from Henry C. Turner Jr., president of the Turner Construction Co., and chairman of the award committee. The award consists of $500 and a Certificate of Award, and was presented to Mr. Menzel "in recognition of noteworthy contributions to the advancement of reinforced concrete construction".

Coming Events

October 8-12, 1951 — Chicago. 39th National Safety Congress and Exposition. Stevens, Palmer House, Congress, Morrison, and LaSalle Hotels.

November 26-27, 1951—Chicago. Convention of National Association of Silo Manufacturers. Palmer House.

February 10, 1952 (week of)—Chicago. 22nd annual convention and exhibit, National Ready Mixed Concrete Association. Stevens Hotel.

A. C. I. Publishes New Building Code On Reinforced Concrete

A new building code, adopted as a standard of the American Concrete Institute at its 47th annual convention, allows for improved properties of new-style deformed reinforcing bars, and results in steel savings in reinforced concrete construction.

Entitled *Building Code Requirements for Reinforced Concrete*, the code covers the proper design and construction of reinforced concrete buildings. It is written so that it may be incorporated verbatim or adopted by reference in a general building code, as have earlier editions. Price of the new code is 50 cents.

Jacoby Elected to Head Montana RMC Association

George Jacoby of Helena, Mont., was elected president of the Montana Ready Mixed Concrete Association, succeeding Floyd Pappin of Great Falls.

Other officers include the following: Adolph Bromgard, Billings, vice-president, and Gene Fehlig, Helena, secretary-treasurer. Oscar Petterson, Butte, C. B. Nicey, Anaconda, and Messrs. Bromgard, Fehlig, and Pappin are directors.

Smithwick Haydite Block Used in Famed Narrows Span

According to S. Carl Smithwick, president of Smithwick Concrete Products, Portland, Ore., the entire deck of the new Tacoma Narrows bridge is paved with Smithwick haydite block. This represents more than a small quantity of the units, since the span is said to be the third-longest bridge in the world.

Smithwick recently announced the development of a water-repellent lightweight block to be used where moisture presents a special problem. The firm also operates a plant at Eugene, Ore.

The Illinois Prestcrete Company, successor to the Prestcrete Division of the Illinois-Wisconsin Concrete Pipe Company, has leased buildings at Plano, Ill., which are being remodeled for the production of Prestcrete floor and roof slabs. The older firm has been turning out slabs at South Beloit, Wis., for about nine years. Crosby Schmidt will have charge of the Plano plant.

Mr. and Mrs. R. F. Miller of Alexandria, Ind., recently purchased the Ice and Canfield Cement Block Company from Abe Ice and Shirley Canfield. The new owners will operate the business under the new name of the Alexandria Cement Products Company.

Concrete Products Assn. Holds Summer Meet in British Columbia

With the largest turn-out in its history, the Concrete Products Association of Washington held a very successful twenty-second annual summer meeting on June 8 through 10 at Harrison Hot Springs Hotel, British Columbia.

The program stressed recreation, but called for one major business session on Saturday morning, June 9. Headlining this session was the election of officers for the coming year.

Talbot Campbell, Seattle Concrete Pipe Company, Seattle, Wash., was unanimously elected to the presidency of the association. B. E. Harrison, Harrison Concrete Pipe Company, Tacoma, was elected vice-president; R. W. Condon, Graystone Concrete Products Company, Seattle, secretary; and Verne Frese, Layrite Concrete Products, Seattle, treasurer. Directors elected for a one year term were: Harold Lutes, immediate past president, Layrite Concrete Products, Spokane; J. W. Sullivan, Bremerton Concrete Products Company, Bremerton; and E. Ellis Cummins, Yakima Cement Products Company, Yakima.

Following the election Wm. A. Haley III, assistant to Howard F. Peckworth of the American Concrete Pipe Association, Chicago, discussed recent developments on the Government's *Controlled Materials Plan.*

E. W. Dienhart of the National Concrete Masonry Association was unable to be present for his scheduled talk on "Masonry" because of a hip fracture sustained by Mrs. Dienhart en route to the coast.

The Advertising Committee held a short meeting in which the "Sunset Magazine Program" was discussed. Mr. James E. Ficken of Frederick E. Baker and Associates, advertising firm, handling the "Sunset" advertisements, was introduced by R. W. Condon, and he explained the campaign's motives and results to date.

Talbot Campbell, new president of Concrete Products Assn. of Washington.

Saturday evening, preceding the banquet, cocktails were served to the guests through the courtesy of the B. C. Concrete Company Limited and the Marpole Brick Company Limited (McCleery & Weston), both of Vancouver, B. C. This was held in the beautiful "Copper Room" of the Hotel.

Dinner was served at 7:30 p.m. and was followed by introduction of guests, and acknowledgements by President Lutes. Introductions as follows: Talbot Campbell, Incoming President; G. P. Ducey, Chairman of the Summer Meeting Committee; Gilbert D. Williamson, Valley Concrete Pipe Company, Yuba City, Calif.; Mr. and Mrs. W. D. Dreher, Colorado Fuel & Iron Corporation, Denver, Colo.; Mr. and Mrs. John T. Brittain, California Wire Cloth Corporation, Oakland, California; Mr. and Mrs. Bailey Tremper, Material and Research Engineer, Washington State Department of Highways, Olympia; Mr. and Mrs. A. P. Blair, Associated Concrete Products Manufacturers, Inc., Eugene, Ore.; Mr. and Mrs. Wm. Arild Johnson, Architect, Everett; Mr. and Mrs. Jay Robinson, Architect, Pasco; Wm. A. Haley III, American Concrete Pipe Association, Chicago.

Mr. A. W. G. (Burt) Clark of B. C. Concrete Company Limited introduced the guest speaker, Mr. G. Roy Long, K. C., Vancouver, B. C., who talked on "Me, Myself and I."

The banquet ended any formal schedule, and members and guests adjourned for recreation of their own choosing.

Left to right: H. C. Lutes, retiring past president of the association; Mrs. Lutes; G. Ray Long; and Mrs. A. W. G. Clark.

Charleston Products Firm Triples Output in New Plant

Everybody was invited when the Concrete Products Company of Charleston, S. C., staged the opening of its new plant at the conclusion of a recent expansion project. Designed to triple the former output, the new facilities were planned and constructed by the Dotterer Engineering Company and the Stearns Manufacturing Company of Adrian, Mich. The expansion program was launched five years ago.

Added to the firm's products will be a new line, "Dura-Blox," which will be available in both cinder and concrete types.

Concrete Products Company was founded in 1928 by the late Thomas C. Stevenson. Its present officers are G. P. De Saussure, president; F. W. Stevenson, vice-president and production manager; and D. R. Stevenson, treasurer and sales manager.

Block Plant to Open In Kankakee, Ill.

A block plant is now under construction in Kankakee, Ill. that is expected to cost about $150,000. The plant will be equipped to manufacture all types and sizes of concrete blocks and is expected to have a capacity of about 8,000 units daily. Production is expected to start about September in the 120- by 80-ft. concrete block building.

The plant is being constructed by the Kankakee Block Company, 1700 East Risser Street, Kankakee, of which Roy Reising is president, Don LaCost and Wesley Reising, vice presidents, and Leland Bauer, secretary-treasurer.

John E. Jones to Handle Permalite Sales in West

John E. Jones has been promoted to the position of acting western sales manager, Building Products Sales Department, Great Lakes Carbon Corporation. He will handle the sale of lightweight Permalite aggregates throughout the entire west.

Previous to his advancement, Mr. Jones was California sales representative associated with the Western Division office. His offices will be in Los Angeles.

Concrete Industry Holds Conference at Fresno On Concrete Problems

A conference on "Practical Concrete Problems" was held in Fresno, Cal., recently by the University of California and other concrete experts. Participating in the conference were: E. L. Howard Jr., testing engineer, Pacific Coast Aggregates, Inc., San Francisco; R. F. Johnson, division of highways, Fresno; J. E. Jellick, manager, Portland Cement Information Bureau, San Francisco; J. W. Kelly, professor of civil engineering, University of California, Berkeley; Nick Volanti, contractor, Fresno; and Walter Wagner, architect and engineer, Fresno.

Directory in Technical Bulletin Available to N.C.M.A. Members

A four-page folder reprinted from the insert in the National Concrete Masonry Association's newly-released *Producers' Council Technical Bulletin No. 60* lists names and locations of all producers of concrete masonry who were members of N.C.M.A. at the time the bulletin was printed. The folder is available to N.C.M.A. members.

The bulletin contains a post card listing through which literature may be requested from various firms listed. A continuing response to this service, shown by hundreds of requests for technical and promotional material on concrete masonry, is an indication of its effectiveness.

Texas Lightweight Aggr. Co. Finances Plant Purchase

Texas Lightweight Aggregate Company, Dallas, Tex., recently offered 19,000 shares of common stock for sale, according to C. L. Moruzzi, president. Purpose of the sale was to purchase the operating assets and inventories of the Thomas Concrete Pipe Company of Corpus Christi. Mr. Moruzzi stated that he expected to derive approximately $255,000 from the offering.

The Thomas company is a branch of the Texcrete Company of Corpus Christi, Inc.

Of the total, 12,599 shares were offered at $14 per share to present stockholders. The remaining 6,401 shares were offered to the public at $15.50 per share.

Texas Lightweight Aggregate manufactures haydite and lightweight precast concrete products. It holds interests in similar plants in Dallas, Fort Worth, Pharr, Stafford, and Rosenburg, Tex.

• Rowland (Casey) Jones of the Keystone Division of Dravo Corporation, Pittsburgh, Pa., demonstrates the effect of different quantities of water in concrete mix to a group of ready-mix truck drivers and production plant personnel. About 100 employees attended the "good practices" training sessions.

Myron W. Krueger, treasurer of the Raymond Concrete Pile Company, New York, N. Y., was recently elected a director of the firm. Mr. Krueger joined the concrete concern in 1948, having previously served as assistant comptroller of the Carnegie-Illinois Steel Corporation.

The Richardson Block plant in North Leitchfield, Ky. has been improved and modernized recently.

Among the improvements are elevators, new storage bins, conveyors, curing plant, ventilating system, and washrooms and offices. This is said to be one of the most modern concrete block plants in the state, although the production is only 2,500 units daily.

Concrete Block Walls Save Lumber Yard from Six-Hour Kiln Fire

The Oak Flooring Dry-Kiln at Gilmer, Tex., was filled with as much dry oak lumber as it would hold when it caught fire. The resulting fire, which burned for about six hours, was about the hottest fire it is possible to have without employing a welding torch or some sort of a gas flame. And yet the owner of the building said he could put his hands on the concrete block walls at anytime during the blaze.

These photographs of the fire itself and the wall standing in good condition amid the complete ruin of everything else are graphic evidence of the fireproof quality of concrete blocks, in this instance, Texcrete blocks manufactured by the Texcrete Concrete Building Products of Dallas and Ft. Worth, Tex.

Because of the fine insulative value and extreme resistance to heat of concrete blocks, this fire did not spread to the rest of the mill.

Two weeks later the kilns were back in operation, having had to replace only about one-third of the walls which were ruined, not by the fire, but by the collapse of the roof.

• This picture, taken at the height of the fire, shows blazing lumber inside the kiln.

• After the fire the concrete masonry walls were found to be undamaged by the flames.

Farm Drain Tile Market Gobbles Full Production of Pipe Plant

No. Illinois Firm Operates Around-Clock Schedule To Serve Farm Trade

By WILLIAM M. AVERY

ABOVE: Lavern A. Miller, Sr., secretary-treasurer of M-R Materials Supply Co. at Peru, Ill., who also supervises plant operations and sales. BELOW: General view of the M-R Materials Supply Co. plant. Although facilities were laid out primarily for the production of concrete brick, the plant now produces only C-4-24 specification drain tile.

another ON THE SPOT report

ALTHOUGH the M-R Materials Supply Company, Inc., of Peru, Ill. is a relatively small organization, it is doing a big job, and an outstandingly good job, in the production of C-4-24 specifications concrete drain tile. The plant, which is located on U. S. Highway 6 just west of the city of Peru, was designed primarily for the production of concrete brick, but it incorporated some facilities for the manufacture of drain tile as a side line. It was operated on this basis for several years by the Peru Building Products Co., but when the present operators took over in March, 1949, brick production was dropped immediately and attention was focused entirely on the farm drain tile market.

The company has built up a sizeable market for its product by placing major emphasis at all times on quality. This is evident in the extreme care exercised in every step of production and curing, and in the company's uniform policy of meeting physical test requirements with a generous safety margin. In implementing the latter policy the company's practices to produce only standard and extra quality drain tile, eliminating altogether the farm drain tile classification provided in ASTM Specifications C-4-24. This means, in effect, that in diameters ranging from 5 to 12 in. no unit is shipped unless it has a minimum average supporting strength of 1200 lb. per linear ft., although the specification covering farm drain tile in these diameters calls for only 800 lb. per linear ft.

Masons sand, torpedo sand, and ⅜-in. and ⅝-in. gravel are used as aggregates. These materials, as well as bagged portland cement, all come to the plant by truck. The aggregates are received in separate sizes and are blended in the desired proportions at the plant. The method of proportioning is somewhat unusual in that it involves the use of small steel hoppers which are permanently located at each of the aggregate piles. Each hopper contains a movable steel weir which can be quickly adjusted to make its volume conform to the amount of material desired in various mixes. Each unit stands high enough so that a wheelbarrow can be placed under the discharge end, and when the desired amount of material has been shoveled in, the contents are discharged into the barrow by tripping a gate in the bottom of the hopper.

Torpedo sand, which predominates in most mixes, is handled by mechanical means. A Farquhar belt conveyor located outside the plant building elevates this material from a truck hopper to an overhead bin. Inside the building all the materials are elevated by means of a conventional skip hoist and discharge into a 16-cu. ft. Dunn batch mixer located on a balcony above the pipe machines.

Two machines are in service—a Dunn Champion for small tile, and

a large packer-head machine for making pipe 14 in. in diameter and up. The latter unit, which was designed and built by the operators, is direct-driven by a 20-hp. electric motor. A pivoting conveyor located under the discharge gate of the mixer feeds either pipe machine.

An interesting feature of the small machine is a special tripping device and timer which automatically starts the feed conveyor when the head is lowered and keeps it running just long enough to feed the amount of concrete required for the size of pipe being made.

The table below the big machine and the packer head itself are raised and lowered hydraulically, the hydraulic system consisting of a standard Vickers unit. The machine was originally built with a stainless steel packerhead, and the wear was so severe that it was necessary to replace the part after it had produced less than 100 ft. of pipe. Shortly before we visited the plant the company had installed an experimental unit the wearing surfaces of which had been coated with Coast Metals "101" hard-facing material. After 500 ft. of pipe had been made with this packerhead, there was still no evidence of serious wear. When the part has worn enough to impair its performance, it can be recoated with the same material at a fraction of the cost of new unit. The work is done in a commercial welding shop.

All production is steam cured in three low-pressure kilns of conventional design. Steam is supplied by a new completely automatic oil-fired Kewanee boiler. Two of the kilns measure 8 by 40 ft. and will accommodate about 100 18-in. diameter tile. The third kiln measures 16 by 40 ft. and will hold 120 18-in. tile or equivalent.

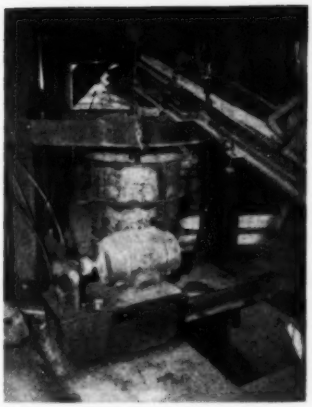
The maximum temperature reached during the "steam on" portion of the curing cycle is about 130 deg. F. On small-diameter tile steam is admitted to the kilns for a period of at least 8 hrs., and on larger units the minimum period is 12 hrs. In either case the cycle ends with a soaking period of several hours duration after the steam supply is cut off. During hot summer weather the units are sprayed on the storage yard for three or four days after they leave the kilns. By adhering to a relatively long steam curing cycle the company has found it possible to cut down on yard storage time when circumstances demand it. On a few occasions tile have been delivered the third day after they were made, but in all such instances the contractor is warned that the units are still green.

The kilns open at one end into the machine room and at the opposite end onto a 200- by 380-ft. well-graded storage yard. The yard slopes gently away from the kilns so that the pipe may be rolled into storage with the minimum effort. The inventory of finished tile ranges as high as 1500 tons. All diameters of C-4-24 drain tile from 5 to 36 in. are carried in stock. Tile 14 in. in diameter and larger are made in 3-ft. lengths only, while the smaller diameters are produced in 1- and 2-ft. lengths. No bell-and-spigot, or tongue-and-groove, or reinforced pipe are produced at present. All trucking both into and out of the plant is handled by contract haulers.

The output of the plant averages about 45 tons per day, and all of the material is currently going into farm drainage work. The company's success in developing this single market is perhaps best indicated by the fact that last summer it was necessary to operate the plant 24 hrs. a day to try to keep up with orders. Despite this the plant was in arrears by about 100,000 ft. of tile when we visited Peru late in the fall.

In its advertising and selling efforts this company constantly emphasizes the importance of proper engineering and installation in drainage work, in this way assuring that its own product, manufactured in accordance with the highest standards, will have the maximum opportunity to preform satisfactorily "Regardless of engineering design or materials used", says an information leaflet prepared by the company, "no installation will be entirely satis-

(*Continued on page* 145)



ABOVE: Close-up of the large packer-head machine used for making tile 14-in. in diameter and up. Pump for hydraulic system is in the foreground.

ABOVE: Steam for curing is supplied by this fully-automatic oil-fired boiler. BELOW: Loading cured tile on truck for delivery.

America's Oldest Lime Manufacturer Now Markets Central-Mixed Concrete

another ON THE SPOT report

By WILLIAM M. AVERY

LATE last year the oldest lime-producing concern in the country broadened its operations by erecting a modern central-mix concrete plant, incorporating several unique features which will be of interest to the ready-mixed-concrete industry. The parent company is G. & W. H. Corson, Inc., of Plymouth meeting, Pa., and the subsidiary operations are conducted under the name of Corson Concrete Company, Inc. In addition to lime, the parent organization produces crushed limestone, agricultural limestone, refractory dolomite, and various related products.

The concrete plant, which turns out a little over 400 cu. yd. per 8-hr. day when operating in conjunction with ten 6-cu. yd. agitator trucks, was designed for the most part by Fanning-Schuett Engineering Company. The aggregate-handling system consists of a ground-level truck hopper, a 24-in. by 224-ft. inclined Robins conveyor equipped with a Hewitt-Robins Maltese Cross belt, and a turnhead at the top of the plant to direct the flow into any one of six 40-ton bins. The truck hopper is so located with respect to a flanking railroad siding that it can at need be fed directly from hopper-bottom cars by means of a portable under-car belt conveyor.

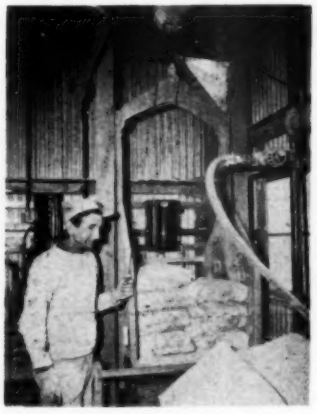
Bulk cement is handled by means of a conventional closed circuit system consisting of an undertrack screw conveyor, and a bucket elevator which discharges into overhead bins or into either of two 800-bbl. steel silos. Cement is reclaimed from the silos and fed to the bins by means of the same screw conveyor and elevator. Each of the three overhead bin compartments has a capacity of 200 bbl., but since one compartment is used exclusively for storing fly ash, the net cement storage capacity in the entire system is 2,000 bbl.

Steam for heating the bins and mixing water during winter operations is supplied by a 30-hp., oil-fired, fully-automatic Cyclotherm steam generator. Two of the aggregate bins (one used for sand and the other for stone) are equipped with coils for heating, while in the remaining four bins open jets are used. The bins are additionally heated by means of steam coils which are mounted against the walls of the batch control room.

An unusual and well worth while provision in the design of the plant is the inclusion of a small platform elevator, located in one corner of the structure, for general service and for handling calcium chloride, lime and other additives used in the mixes. Power for the 35-ft. lift from ground level to the batching floor is provided by a half-ton Budgit hoist. The elevator platform measures 2½ by 3½ ft. It saves many a wearing climb up the plant stairs with bagged materials and other supplies.

Fly ash is used in all mixes unless the customer specifies to the contrary. This practice is at least in part a result of experience gained in Corson's own laboratories while conducting extensive research work on fly ash for a number of utility concerns. The cement content of a 1-cu. yd. batch is cut by about a bag, and replaced by the equivalent of two 94-lb. bags of fly ash. As stated above, one 200-bbl. compartment of the overhead bin is used exclusively for fly ash, although the material is also occasionally handled in bags.

The equipment used for elevating bulk fly ash to the bin is noteworthy. It consists of a tank, or bottle mounted on a special semi-trailer which also carries an air compressor. The unit, which was designed by



AT LEFT: General view of the new central-mix concrete plant operated by Corson Concrete Co. at Plymouth Meeting, Pa., just outside of Philadelphia. BELOW: One of the unique features of the plant is this small elevator for hoisting lime, calcium chloride and other additives to the batching floor.

Kennedy-Van Saun, carries about 8 tons of material. It is loaded at various power-generating stations in the Philadelphia area and hauled to the Corson plant at Plymouth Meeting. Using air supplied by the compressor on the trailer, the fly ash is blown from the tank to the plant bin by means of jets. A full tank can be unloaded in this manner in about 30 minutes. The storage bin is vented with an 8-ft. stack, and the loss of material is extremely small.

On the batching floor cement, fly ash, sand and coarse aggregate are accurately weighed by means of a 4-beam Bennington suspended platform scale and a Spinks paddle dashpot indicator. The flow of aggregates from the bins into the batcher is facilitated by Syntron vibrators, and there are snap valves in the throat of the cement hopper for aerating this material from time to time. The valves are so located with respect to the levers which operate the bin gates that the operator can open them at any time for the few seconds required to restore full flow of cement from the bin.

Other features of the batching setup include a Ransome syphoning system for positive control of the amount of water used in the mix, and an automatic dispenser for making predetermined additions of an air-entraining agent. When it is desired to entrain air in the concrete, one ounce of Darex A. E. A. is used per bag of cement.

Most orders are central-mixed at the plant, using a Ransome 2-cu. yd. non-tilting mixer. By merely throwing a flop gate operated from the batching floor, however, the mixer can be by-passed, and the dry-batched materials will be loaded directly into the trucks. Deliveries are handled at present with a fleet of ten 6-cu. yd. Rex mixers mounted on L210 International trucks. Output in an average 8-hour day runs in excess of 400 cu. yd. with this fleet. Four men, including a plant manager, operate the entire plant.

All coarse aggregates and about 50 percent of the sand used in concrete operations come directly from the company's own crushing plant located on the same property. To save rehandling, coarse materials are trucked from the washer to the concrete plant without intermediate stockpiling. Stone sand, however, is allowed to dry somewhat in stockpiles before it is hauled to the batching plant. Since the sand produced in the company's stone processing plant is relatively coarse for use in concrete, it is blended with fine Jersey sand in the ratio of about 60 to

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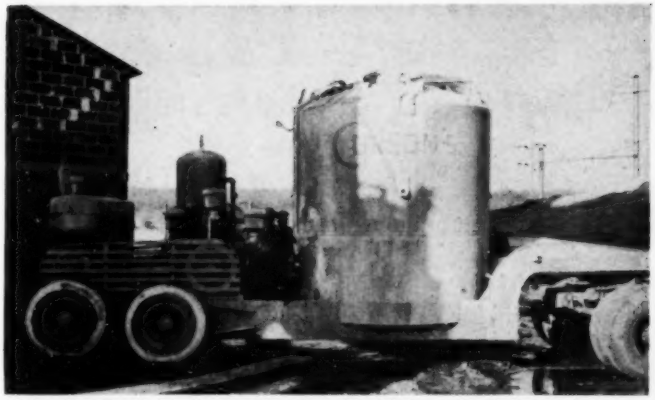
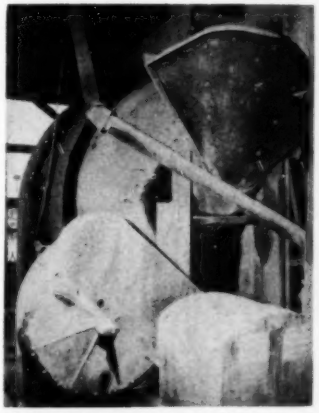
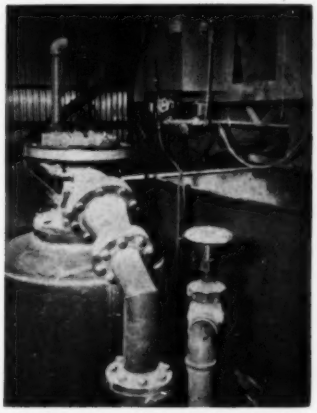
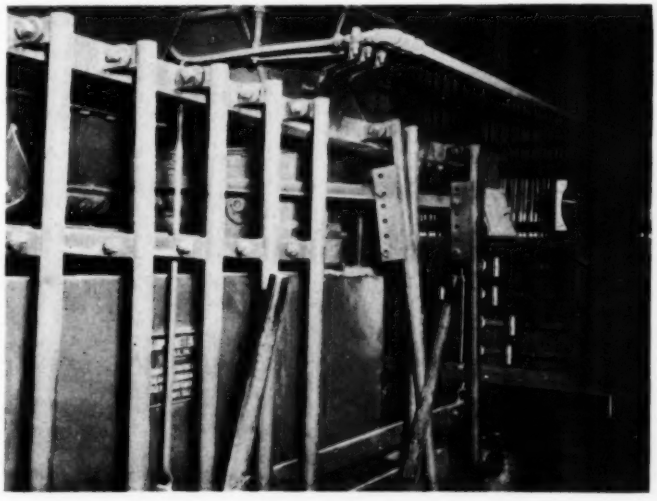


Air jets blow fly ash into the plant bins from this eight-ton tank. The tank and air compressor are mounted on a specially designed semi-trailer.





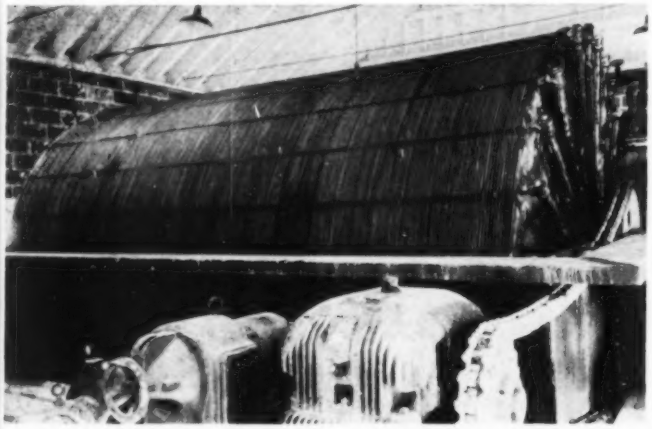
ABOVE, LEFT: Concrete is mixed at the plant in this 2-cu. yd. non-tilting batch mixer. It is also possible to by-pass the mixer and load out dry batched materials. ABOVE, RIGHT: Positive control of water is assured by use of the syphoning device shown at left, with automatic dispenser for air entraining agent located above. BELOW: Materials are accurately weighed by means of a 4-beam suspended platform scale.



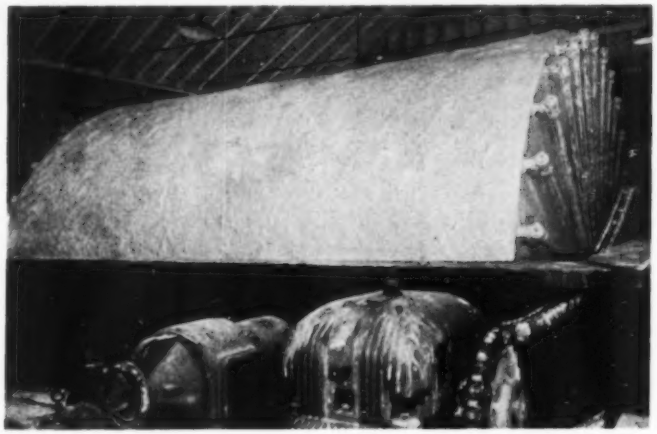
New "M. K." Lime Process Eliminates Aging Tanks, Reduces Cooling Time

COLONIAL Blue Diamond Mortar Corporation has just put into full production the new M. K. patented process for producing superior lime putty. It is now operating full blast at their Astoria, Long Island, N. Y., plant. Unquestionably it is a completely revolutionary method of producing slaked lime putty. By this method the large and expensive aging vats or tanks are completely eliminated, with the attendant time element for cooling and dewatering virtually eliminated. The time element is reduced from days to minutes, the putty being ready for use immediately as it leaves the machine. It has the further advantage that, no matter from what part of the machine a sample is taken, it is uniform in consistency and coolness. One would say after viewing the operation that it is completely foolproof and a very simple operation.

Either high calcium or dolomitic quicklime can be used, although Colonial Blue Diamond uses only high calcium lime. The quicklime is delivered by specially constructed conveyor trucks and dumped directly into a receiving elevator where it is lifted to the storage tank immediately above the mechanical slaker. The discharge gate of the slaker is fitted with a batch weighing device that accurately measures out the amount of lime entering the slaker. The water is passed through a Neptune Meter. In this way each batch is measured accurately, assuring a uniformity rarely obtained in the slaking of lime. After the required period in the slaker, this hot milk of lime is passed over a 20-mesh Link-Belt vibrating screen, and is then pumped directly into the vat of the coil spring filter where it receives its final processing.



Above: Filter before starting up. Note drum with coil springs and vacuum pipes at end of drum. Below: The filter drum showing the heavy mat of lime picked up by the vacuum.



As the drum of the filter slowly revolves in the vat, the vacuum, which has been set at a desired number of inches, picks up the lime slurry and conveys it over the drum in a solid mat, the thickness being determined by the predetermined inches of vacuum. The mat is carried by stainless steel helical coil springs. As these springs progress with the drum they come to a point where the vacuum is released and shortly thereafter the springs with their mat of lime leave the drum and pass over a discharge roller where the mat of lime is peeled off by metal fingers. The now finished lime putty drops to a receiving hopper while the springs separate and pass through a high pressure spray that washes off a slight residue and then return to their position on the drum to again enter the vat and pick up a fresh mat of putty.

The residue that is washed off is pumped to a storage tank where it is reused in slaking subsequent batches, thereby resulting in no loss of lime or water. This same tank receives the water that is extracted from the mat by the vacuum and reused in the same manner.

The reuse of the water is important, as in New York the water is expensive and its use sometimes restricted.

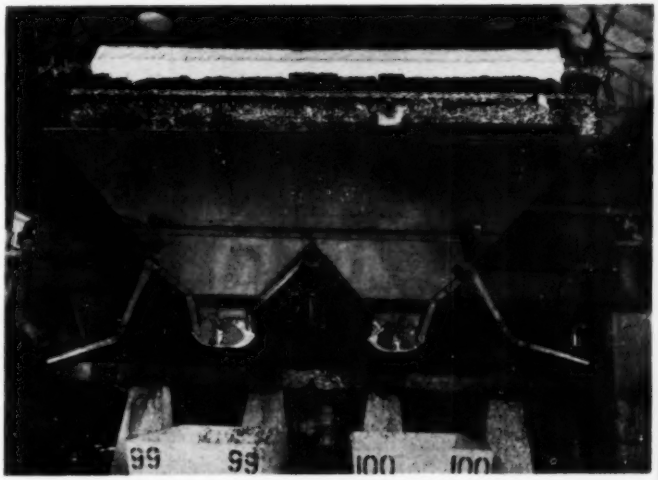
From the receiving hopper the lime is loaded into steel boxes for delivery, it being possible to load two boxes of 27-cu. ft. capacity each at one time. The boxes are handled by high-lift fork loaders and

placed directly on specially-constructed boom trucks for delivery to the various jobs.

We have described above only the production of lime putty for Plasterer's white coat finish for which this plant will be almost exclusively used due to the heavy demand for the product. However, the identical procedure is used in the production of lime putty for brick mortar or stucco, with the exception that the production would be speeded up by increasing the rotating speed of the drum. This would result in a greatly increased production although the resulting putty would be of a softer (wetter) texture entirely adequate for brick mortar or stucco and would be conveyed to the mixing plant or trucks by either a belt conveyor or a pump satisfactory for this work.

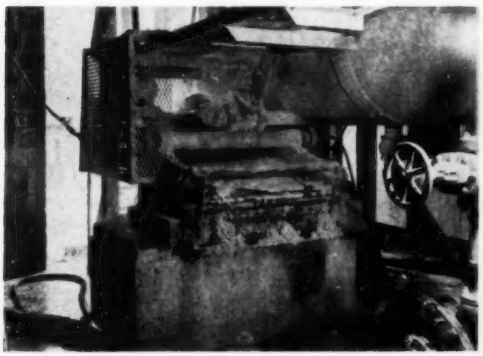
A considerable quantity of the new material has reached the customers (plasterers) and all reports today are very gratifying. Higher plasticity, greater spread with better body or covering capacity, are reported.

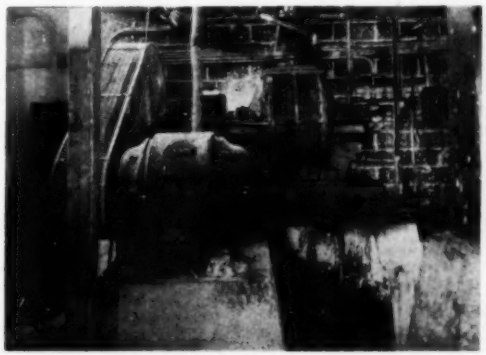
Durando Miller, vice-president of Colonial Blue Diamond Mortar Corp., states that with 25 years' experience, he has never seen a material equal to the product they are now producing. Mr. Miller states that they are ready to discuss with interested parties exclusive patent licenses, and Thomas R. Komline, co-inventor, is in a position to design, erect, and put into operation plants anywhere in the world through his firm, the Komline-Sanderson Engineering Corporation.



Mat of processed lime leaving the coil springs of filter and dropping into receiving hopper for loading into boxes and delivery to the job.

Below left: View of mechanical slaker, vibrating screen and pump to filter. Below right: View of the 75 hp. vacuum pump.





Farm Drain Tile

(*From page* 141)

factory unless properly installed. Drainage installation is a type of contracting in which the completion of the installation automatically removes the important portion of the work from future visual inspection. A properly qualified contractor of known integrity and proven experience is the best assurance of good workmanship and a failure—free installation." In the same pamphlet there is a list of about 20 qualified drainage contractors located in the section of Northern Illinois served by the M-R plant.

Officers of the M-R company are Robert Rolston, president, Lavern A. Miller, Sr., secretary-treasurer, and Lavern A. Miller, Jr., vice-president. Mr. Miller, Sr., also operates the Miller Engineering Service at Streator, Ill., serving more than 20 small towns in the area as municipal engineer.

The Gifford-Hill Construction Company, Dallas, Tex., was recently awarded a contract to furnish concrete for the Lone Star steel mill at Hughes Springs, Tex. According to P. W. Gifford, the contract calls for 85,000 cu. yd. of ready-mix. As soon as the mixers are in operation at the Lone Star site, ready-mix will be available to the public.

At Benton, Ill., the Franklin Concrete Company's facilities have been purchased by E. G. Hurst and A. P. Rosche of Hillsboro, Ill., and R. S. Burberry of Benton. The former owners were Lambert Jones, J. Webb Jones, and O. M. Andres. Mr. Burberry will serve as resident manager, and the business will be operated under the same name.

How to Determine Industrial Truck Battery Requirements

By J. E. VAUGHAN
Supervisor Field Engineering
Gould-National Batteries, Inc.

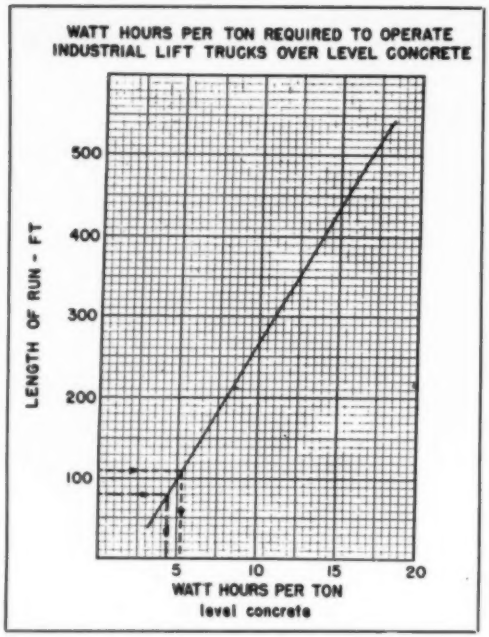


FIGURE 1: This graph indicates the watt hours per ton required to move an electric truck along a given length of level run.

another P-Q exclusive

DETERMINATION of capacity of storage batteries which power electric industrial trucks is often left to the truck supplier, the battery representative, just plain guess, or duplication of present batteries. However, there is an engineering procedure, which, if followed, will enable the purchaser to correctly specify his own battery requirement or check suppliers' recommendations. In addition, these calculations[1] will insure against purchasing under capacity batteries which run down before the end of the shift, or conversely, over-capacity batteries calling for unwarranted initial cost.

To illustrate the procedure for determining industrial truck battery capacities we will assume a typical case — a 3,650 lb. truck, 2,000 lb. load, 3 ft. average lift, 110 ft. average haul and 30-ft. 10 percent grade to be traversed by loaded trucks.

It will be necessary to determine the power (watt hours) required to traverse the average haul distance loaded, climb the grade, traverse the haul distance empty (grade deducted), lift the load for stacking, and tilt the mast for load-centering.

Figure 1 indicates the watt hours per ton required to move a truck along a given length of *level* run. We can use this graph to determine the power required to travel the average haul distance. By following the dotted lines we see that 5.4 watt hours are required to haul 1 ton along the 110-ft. haul of our example. Our total load is 3,650 lb. (truck) plus 2,000 lb. (load) — 5,650 lb., or 2.825 tons. Multiplying 2.825 tons by 5.4 watt hours gives 15.25 watt hours reguired for the level run.

We can determine the watt hours required for going up grade (in addition to that required for level running) by using the formula: watt hours = tons (truck plus load) x ft. (length of grade) x grade (percent) x .013 (a constant). 2.825 tons x 30 ft. x 10 x .013 = 11.02 watt hours (extra power for grade).

Then to calculate watt hour requirements for the empty return trip, deducting the grade, we have the 110-ft. total return distance less the 30 ft. of grade, or 80 ft. Again using the graph (dashed lines), we see that 4.4 watt hours are required per ton on the return trip. As the weight is now 1.825 tons, we multiply 4.4 watt hours by this figure getting 8.03 watt hours.

To determine the watt hours required for lifting, we use the following formula: watt hours per lift = tons of load x ft. of lift x 2 (a constant). Thus, 1 ton x 3 ft. x 2 = 6 watt hours required to lift the load. (For unstacking, the following formula applies: watt hours per lift empty = 1/3 load capacity in tons x ft. of lift x 2.)

To determine the energy required to tilt the mast, we use the following formula: watt hours per tilt loaded = tons of load x 1 (a constant). Thus 1 ton x 1 = 1 watt hour per tilt loaded. (Watt hours per tilt empty = 1/3 load capacity x1.)

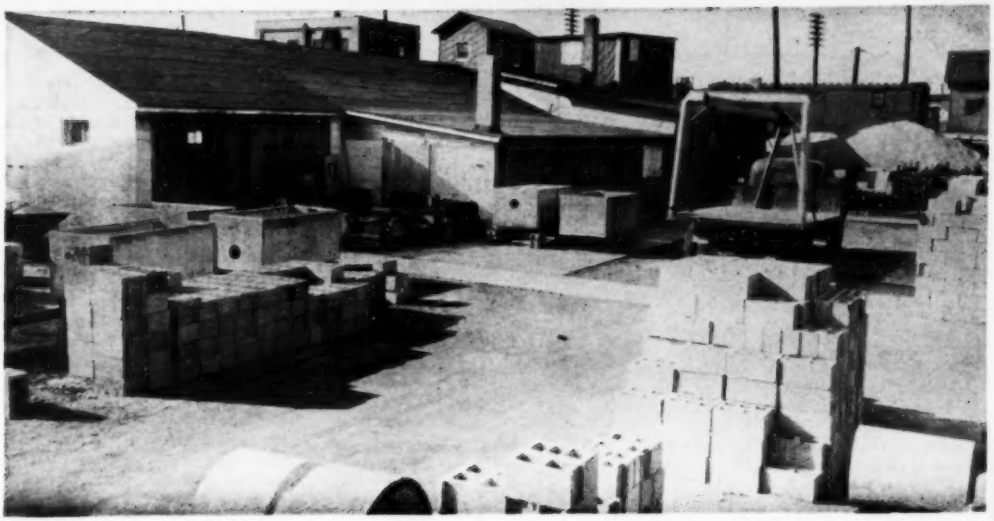
Summing up we have:

	Watt Hours
Run with load, no grade	15.25
Extra power for grade	11.02
Run empty, grade deducted	8.03
Power required per lift	6.00
Power required per tilt	1.00
Watt hours per trip	41.30

Assuming 250 trips per day, a total of 10,325 watt hours of battery power are required. If we select a 32-volt battery, as recommended by truck manufacturers for this size truck, it must have approximately 323 ampere hour capacity. (Ampere hours equal watt hours divided by volts, hence the ampere hours required equals 10,325 watt hours divided by 32 volts or 323 ampere hours.) Battery manufacturers' catalogs give ampere hour capacities of various sized cells.

By following this procedure, the purchaser can effect economies which will be reflected in multiple since future purchases of batteries for given applications will be based on original computations.

1. Formulas used are from the Handbook of Material Handling published by the Electric Industrial Truck Association, 1950.



General view of the yard and main plant building of John H. Campbell & Company, Kankakee, Ill. Specially equipped truck at the right is used for delivering septic tanks.

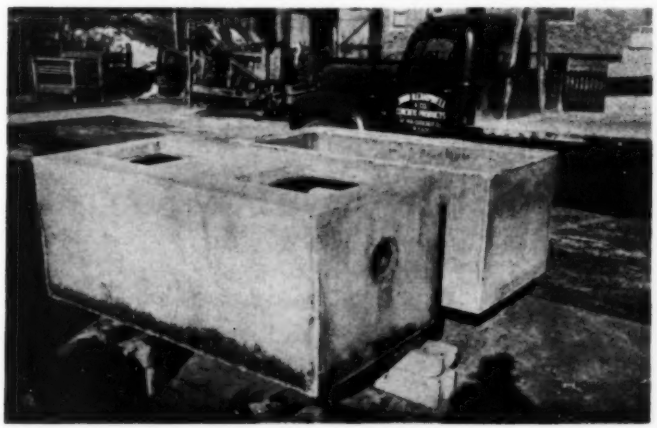
Septic Tanks Come First With This Illinois Concrete Products Concern

By WILLIAM M. AVERY

JOHN H. CAMPBELL & Co. of Kankakee, Ill., has been active in the concrete products field for almost a quarter of a century, but its primary interest throughout that period has been with an aspect of the business which many concerns relegate to the "also-ran" status. Although it always sells and occasionally produces other precast concrete products, this company has specialized throughout its entire career in the production and sale of concrete septic tanks.

Last year the company produced and sold over 250 concrete tanks, most of which were marketed through local plumbing contractors. At the present time all production consists of 500-gal. two-piece rectangular tanks made with steel molds supplied by Carpenter Manufacturing Co. These units provide for a liquid depth of 48 in., and for an air space of 12 in. above water. The walls are 3 in. thick and the outside dimensions are 39½ in. (width) by 78 in. (length) by 66 in. (total height). Each section requires about 17 cu. ft. of concrete and weighs about 2,500 lb.

Top and bottom section of a tank ready to ship. After the forms are stripped the concrete is moist cured under burlap for 10 days.



The company has molds and other necessary facilities for pouring two complete tanks daily. Although it is possible to pour a complete tank daily with only one outside form (by pouring the halves several hours apart so that the outside form may be reused), Campbell operates four complete sets of molds. Each inside form is expanded and locked on a wooden pouring base, and top cross supports, covers, and (in the case of top sections only) manhole covers are set in place. The form is then oiled and wrapped horizontally with 6- by 10-in., No. 10 by No. 10 reinforcing wire. The outside form is then assembled and locked around the inner form and the mold is ready for pouring. Assembly time is said to total about 15 minutes for one man.

An interesting feature of the form design is that the two square manholes in the top of each unit are poured right in place along with the top section of the tank. The pan-like molds used for this purpose are

Top section of a 500-gal. tank with steel forms still in place. Wooden pouring base has casters to facilitate handling.

placed on top of the inside form and are filled with concrete as the top is poured. Thus one mold acts as the form for both the opening and the manhole cover. Handles are inserted in the concrete before it sets so that the covers may be lifted.

The tank forms are stripped as soon as the concrete has gained sufficient strength, but no attempt is made to obtain more than one use of a set of forms in 24 hours. Immediately after stripping the concrete is covered with burlap and kept wet continuously for about ten days to assure thorough curing. High-early-strength cement is used when it is available, and calcium chloride is added to the mixes during cold weather.

Aggregates used at the Campbell plant are washed torpedo sand, received by rail, and ¾-in. crushed limestone which comes in by truck. Sufficient storage space is available for the equivalent of about seven carloads of aggregates and two carloads of bagged portland cement. For purposes of making septic tanks the aggregates are transported from open stockpiles, and the cement from a separate warehouse on the property, to the plant building by means of a Model 343-A Bell Prime Mover which has a capacity of 1000 lb. The materials are mixed with a Ransome Blue Brute 3½S portable mixer, which is equipped with a water gauge and a loading skip.

For delivering the tanks and setting them on the job the company uses an International flat-bed truck equipped with "A" frames to support an "I" beam which is parallel to the axis of the truck. The tanks are picked up by means of a two-ton hand-operated chain hoist, and the movement of the load on the "I" beam is controlled by a special shifting mechanism developed and supplied by Carpenter Manufacturing Co.

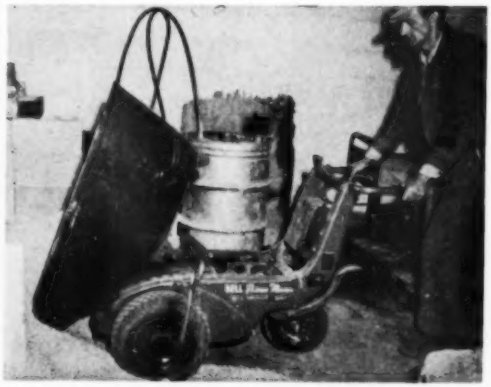
Campbell also makes precast concrete distributing boxes and grease traps for use in conjunction with its septic tanks. A distributing box is used between the septic tank and the drain field, a single line from the tank feeding the box through an end opening which is one inch higher than the outlets. The side walls are cast in such a way that outlet holes may be knocked out on the job as required.

Although the company's main business is the manufacture of septic tanks, it has always produced and sold some concrete masonry units. The plant is equipped with a Stearns No. 7 Joltcrete machine for the production of standard masonry units, and a Miles "face-down" machine for filling an occasional order for rock face units. The Joltcrete machine is served by overhead bins, a floor-mounted batch mixer, and a skip hoist so that its operation can be handled by a two-man crew. Chimney blocks are also made on a Multiplex machine. Heat and moisture are used for curing most of the items produced.

For some years the company has sold far more blocks than it actually produces. Total sales of masonry units now average around 500,000 8- by 8- by 16-in. equivalents per year. Most of the light-weight units included in this total are purchased from block plants in the Chicago area. In this phase of its operations the Kankakee firm acts primarily in the capacity of a dealer, although its own truck and driver are used for hauling the material. In a similar fashion the company functions as a sales outlet for a precast concrete incinerator and grill produced in the nearby city of Aurora. Concrete drain tile and other precast items are also handled in much the same way.

(*Continued on page* 154)

Below left: Concrete masonry units are produced on this cored-pallet block machine. Feed hopper is charged by means of a skip hoist between the block machine and the mixer in the background. Below right: Materials are handled efficiently and effortlessly with this 1000-lb. capacity gasoline-powered buggy.



More Effective and Efficient Steam Curing Through Better Kiln Design

By WILLIAM J. SHORE, M.E.
New York, N. Y.

IN any new industry where growth and development are rapid and expanding, there always exists the condition in which certain component manufacturing processes lag behind others. As an example of this, we cite the block-making industry. Machinery and equipment for making blocks has reached a high degree of perfection. One machine operator can make and load on racks 1440 8-in. units per hour.

In contrast with this outstanding achievement, the steam curing process is today no different from what it has been for the last 30 years; in fact many block plants do no steam curing at all. Steam generators are in many instances large low-pressure, hand-fired boilers; and kilns are always built of concrete block for side walls, with heavy concrete floors and concrete roofs. Later types of kilns use blocks supported between concrete I beams for roofs, a doubtful type of improvement from an operating point of view. Doors are usually made of odds and ends picked up in the plant, leaking at the seams and edges and allowing heat to escape each time they are opened and shut.

An improvement for more intensive use of kilns consists in exhaust systems for cooling block which prevent steam vapors from filling up the working space. In deference to the idea that heat may be saved, block makers in some instances cover the outside masonry surface with insulation.

Present Kiln Faults

These can be summarized briefly, concisely and conclusively as follows:

a) Too much time is required to bring blocks to heat.

b) Too much time is required to cool them.

c) Too much steam is consumed.

d) Too much water remains on the blocks and in the kilns after the heating cycle.

e) Too much fuel is consumed.

f) It is difficult to reach temperatures over 180 deg. F.

The reasons for poor kiln operations are simple. Most steam curing kilns are incorrectly designed and are built of the wrong types of materials. For lack of study of the problem by the industry at large, few changes have been recommended.

Requirements for Ideal Kilns

The requirements which can be met are listed as follows:

a) Kilns should be of such size that they can be loaded in two hours or less.

b) Kilns should be no longer, no higher, and no wider than necessary.

c) It should be possible to seal kilns tightly during the curing cycle.

Ideal conditions which cannot be met, but toward which one might work indicate that a) materials of which kilns are built should not allow any heat loss. b) Materials of which kilns are built should have no weight.

(It must be understood that these requirements cannot be met, but there is the possibility that conditions may be improved gradually to approximate ideal conditions.)

Kilns should not hold blocks in excess of two hours' production. Some block makers use large storage kilns, a practice harking back to the days when blocks were mainly air cured. An entire day's production is loaded into one room and left there to cure and set.

In other block plants an entire day's production is steam-cured in one room during the night and early morning hours. This procedure is as absurd as if a block maker decided to hoist to his bins his entire daily aggregate supply in one bite instead of taking it up throughout the entire working day in small buckets coincidentally while making block. To hoist it in one lot would require huge hoisting equipment which would be used for only a few minutes. The common practice is to arrange for a continuous flow of small quantities. The steam curing cycle should be regarded in exactly the same manner.

Curing the entire day's production demands a boiler plant of excessive size. It is better to operate steam equipment simultaneously with block production. Steam curing in large batches is subject to additional handicaps. If the enclosing kiln is built of heavy masonry, it requires a long time to bring up the heat to the desired temperature. If the kiln is lightly constructed and poorly insulated, great quantities of heat are lost through the side walls and roof. Either or both of these conditions make it extremely difficult to bring temperatures to their high point and keep them there.

A number of smaller kilns, usually four in number, each large enough to be loaded in two hours or less, permit smaller boilers to do the work. At the same time these smaller kilns cut down outside radiation losses by 75 percent, and the chances for doing a better curing job are definitely enhanced.

Kilns should be no longer, higher nor wider than needed. The reasons are self evident. A kiln that is larger than necessary requires more steam for the same amount of block cured than a kiln that is just the right size. There is no advantage in oversize kilns. Ceilings in practically all kilns are too high. The temperaturue is always highest on the roof, and then extends downwards. Generally there are no blocks in the upper 2-ft. space of a kiln where the heat is most intense. Many block makers looking ahead to future expansion build kilns large enough to meet these ultimate loads. This is the wrong approach to the problem. Kilns should be built close for present requirements, and for future needs they should be extended outward. An oversize kiln penalizes the block maker and renders his steam curing operations less satisfactory.

Kiln closures should be tight. This is a simple requirement, but not always easy to achieve. Loosely fitting doors are partially responsible for the troubles of which block makers complain. Loose doors allow cold air to enter the kiln and hot air to escape. As a result, there is a lack of uniform quality in the blocks. Those near the doors are the blocks that have entered the kiln last. They have not had the setting period of two hours which those blocks first loaded in the kilns have had. Therefore, with actually but little setting time and with far less heat than all the other blocks because of door leaks, the quality

of the blocks on racks near the door will not be the same as that of blocks at the far end of the kiln.

Badly fitting doors are generally due to the fact that doors are given consideration only after the kilns have been completed, whereas to obtain thorough and sound door closing equipment, all door jambs should be incorporated into the kiln structure. Too often openings are made of unrelated pieces added at a later date. It is a matter of sound planning when building kilns to take measures for door erection and installation.

Now let us consider conditions which might be called ideal. *Materials of which kilns are built should not allow the loss of heat.* It is common knowledge that no such materials exist. It is also known that the rate at which heat is transmitted or conducted through materials varies widely. Silver and copper transmit heat rapidly. Stone and masonry also transmit heat, although at a lower rate than metals. Materials like diatomaceous earth, vermiculite, and glass wool or spun slag transmit heat very slowly indeed. Materials of the last class prove useful in creating building structures which retard the flow of heat in or out of a structure, and these materials should be employed in the construction of block kilns, instead of solid concrete masses. The application and use of these materials poses new problems, for their effectiveness is vastly reduced when they are in contact with steam vapors and fumes. Thus to make their use and application a practical affair, precautions must be taken to shield them from corrosive and wetting mediums.

Many block makers use materials of this type on the *outside* of their kilns; but, as will be shown later, this is a wasteful and ineffective type of application. For a kiln of standard construction with an inside length of 45 ft. and width of 12 ft. 6 in. and a height of 7 ft. 6 in., the average loss of heat during a four-hour heating cycle for a load of 1,500 standard 8-in. units amounts to 300,000 B.t.u.'s.[1] Translating this into terms of oil fuel, it means that three gallons are required over four hours just to offset the heat lost to the outside atmosphere. Putting it in pounds of steam, it means that it is necessary to put an additional 300 lb. of water in the kiln as steam merely to offset the loss of heat through the structure walls.

Nominal loss of heat in kilns through walls, roof, and floor approximate 10 percent of the total heat required for a heating cycle. With good insulation properly applied, it is possible to reduce this loss by 75 percent. Instead of 300 lb. of water in the kiln, there will be only 75 lb. There is no need to pile on great quantities of insulation to reduce this loss, because the total amount of heat lost is not excessive, at least when compared to the amount of heat required. Insulation is an important requirement in the makeup of all well designed steam curing kilns.

Materials of which kilns are built should have no weight. On the face of it, this is indeed an absurd statement, for it cannot be accomplished. As we develop this idea further, however, it becomes evident that all of the difficulties encountered by block makers in the steam curing process are directly attributable to the materials and method they use to build their steam curing kilns. Still more pertinent, the more substantially and soundly kilns are built, the more prevalent are problems such as "too long to heat up," "too long to cool," "too much water in kilns," "blocks too wet," etc. The answer to all of these is simplicity itself. All of these kiln troubles are due primarily to the materials from which kilns are built.

[1]See article on *Heat Balance in Steam Curing Kilns* by W. J. Shore, PIT AND QUARRY, May, 1951, p. 224.

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When steam is shot into a loaded kiln with blocks on pallets and pallets on racks, the heat dissipates itself indiscriminately. It heats blocks, racks, pallets, kiln air contents, door, floor, roof, and walls. It is not selective. While we desire only the blocks to be heated, the steam heats everything with which it comes in contact.

Blocks cannot reach the desired temperature until every other bit of surface in the kiln reaches a like temperature or close to it. Blocks cannot be at 180 deg. F. and the roof at 70 deg. F. When blocks are at 180 deg. F., everything else in the kiln is close to that temperature. Some parts may be a bit higher, and others somewhat lower, but in general, before we can get our blocks to heat, all of the kiln interior must be at the same heat or close to it. It is this factor that is primarily responsible for the many headaches in kiln operation.

Heat Input and Distribution

If we proceed further and analyze the heat input and heat distribution in a typical block curing kiln, we find the data shown in the accompanying table. The figures are for a typical kiln 45 ft. long by 12 ft. 6 in. wide by 7 ft. 6 in. high containing 1,500 8-in. blocks.

Heat Requirements for Steam Curing 1,500 Standard Blocks in B.t.u.'s

For 1,500 blocks	1,233,000	
For Steel racks	115,200	
For solid steel pallets	266,000	
	1,614,200	
Less heat given up by cement hydration	360,000	
Net for blocks, racks, pallets	1,254,200	1,254,200
For concrete kiln enclosure	1,331,000	
For balancing loss through kiln areas to outside and ground	300,000	
Total for kiln enclosure	1,631,000	1,631,000
Total heat demand in B.t.u.'s		2,885,200

To translate these B.t.u. values into terms of fuel oil and water supplied to kilns, let us assume that 1,000 B.t.u.'s of steam are equal to 1 lb. of water and 100,000 B.t.u.'s of steam are made by one gallon of fuel oil. The extra heat required for the kilns and for the replacement of losses through the walls demands the use of 16 extra gallons of fuel oil. Because of the extra steam introduced into the kiln to heat the enclosure and to replace radiation losses, 1,631 extra lb. of water are supplied to the kiln.

The use of 16 extra gallons of fuel increases the cost for steam

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Truck Mixer Manufacturers Bureau

BLAW-KNOX DIVISION, Pittsburgh, Pa.
CHAIN BELT COMPANY, Milwaukee, Wis.
CONCRETE TRANSPORT MIXER CO., St. Louis, Mo.
THE JAEGER MACHINE COMPANY, Columbus, Ohio
THE T. L. SMITH COMPANY, Milwaukee, Wis.
WORTHINGTON PUMP & MACHINERY CORP., Dunellen, N. J.

curing block. The 1,631 extra lb. of water in the kilns create "excessively wet kilns and wet blocks."

It requires more time to dissipate this extra water, some of which is on the blocks, and it takes longer for the blocks to dry and become hard. It also requires extra blower capacity to pull these excess pounds of vapor from the kilns when the blocks are being cooled off preparatory to being removed from the kilns.

It should now be plain that many of the troubles generally associated with steam curing are the direct effect of heavily built masonry kiln structures. With heavy concrete roofs and concrete block walls, it is impossible to steam cure blocks without great excess quantities of water.

This heavy construction retards the heating up cycle and retards the cooling cycle. It is in effect a thermodynamic flywheel, and it is troublesome and burdensome. Strangely enough, the block industry still is building kilns of heavy concrete and masonry, compounding and aggravating their kiln troubles all the while. It is impossible to build kilns without weight, but it is possible to build them of very light weight material. A battery of three old-style kilns as described above, weighs 280,000 lb.

It is possible to build a battery of four kilns of like capacity to weigh 76,000 lb., including complete insulation all around. (No doors included.) With this great difference in weight, combined with complete insulation (instead of requiring 1,631,000 B.t.u.'s for heating structure and taking care of heat loss), only one-fourth the amount of heat would be required (based upon weight proportion) or 407,000 B.t.u.'s, to which we add the heat necessary for the blocks, making a total of 1,661,000 B.t.u.'s, in place of nearly 3,000,000 B.t.u.'s as before, with heavy masonry kilns. The old kiln would require 29 gallons of oil per cycle, while the new one would require 16 gallons, a saving of 13 gallons per 1,500 blocks or 40 gallons per day for 4,500 blocks. This is roughly $1,000 per year in fuel savings. Still this would be an advantage of only minor importance.

The greatest advantage would be that instead of getting close to 3,000 lb. of water in the kiln, there would be only 1,600 lb. The need of getting rid of water vapor from 1,400 lb. of water would be eliminated. Using the same amount of fuel as before, the time of heating up, if before 4 hours, would now be slightly more than 2 hours. Thus there would be an added 2 hours' use of kilns, which is no mean advantage for a block maker short on kiln space.

Effect on Cooling Blocks

In kilns constructed of lightweight materials there is not so much heat in kiln walls, and it becomes easy to cool blocks quickly. A further advantage results from having less water vapor in the kiln.

Insulating Outer Kiln Walls

Insulation on the outside of kilns is of little practical value. It does cut down heat transmission losses, but as shown, these amounted to only 10 percent, and a saving of 7.5 percent is possible at best, virtually a negligible amount. Putting insulation on the outside in a sense aggravates the condition of time lag and extra steam required by heating the interior kiln walls.

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INVOLUTE SPLINES
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A vital link in the strength, toughness, and durability of UNIT equipment is the use of involute-splined shafts. Compare the 3 shaft drawings and note the superiority of involute splining. In the outmoded, single-keyway shaft, the driving force is concentrated at one point, making it the least efficient and subject to easy breakage or wear. The 10-spline shaft, commonly used in the industry, is a great improvement over the single-keyway — but is still not the most efficient! Involute splining is better able to take the severe beating of daily use. Its multiple splines allow a greater area of contact with the mating member, providing a more equal distribution of driving force under load. As a result, wear is reduced and replacement is seldom necessary. Involute splining requires less tooth-depth, eliminates sharp corners, thus making possible a shaft of greater diameter and strength. Only the advance design of involute splining gives full, peak efficiency — the reason it is used in every UNIT machine.
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What takes place is that these inside walls get heated to the block temperatures all the way through to the insulation. Thus a considerable heat storage reservoir is built up in these walls. If this heat could be used to advantage and not dissipated, it would have value. But unfortunately after a kiln is emptied, it is left open for two or three hours during loading, and the heat stored up is dissipated to the outside air through the kiln door opening. If anything, the addition of insulation to outside walls serves to add to the flywheel effect, definitely retarding any chance of bringing blocks up to heat at reasonable acceleration.

No one has ever complained about blocks heating too quickly, and it is our belief that the burden of large masonry masses slows down any normal temperature rise. Insulation should be put on the inside of kilns. True, it is a more difficult matter; but it should prove far more effective and more useful.

New Type of Kiln Construction

Old kilns can be made more effective by placing and installing insulation on the inside walls. The matter of installation is not simple, and it offers many obstacles. It can be done, but it is costly.

For the new lightweight insulated type of kiln various combinations of standard building materials might be used. Wood construction, properly shielded against vapors by creosoting or other treatment would prove satisfactory. Wood panels with rock wool insulation would serve excellently, as well as structural aluminum or magnesium alloys. If provisions were made for installation and protection of insulation, these kilns would deliver remarkable results. One block maker has this type of kiln and reports that he is able to bring his kiln temperature to 240 deg. F.

Cost of Lightweight Kilns

A lightweight kiln 36 ft. wide by 52 ft. long with a daily single shift capacity of 4,500 blocks or (9,000 blocks for two shifts) could be built for between $3,000 and $3,500. Conditions vary widely in the United States, and different materials would be used in different sections. No one material is best for this use, and there are countless varieties which could be employed.

Summary

From a structural point of view there is no sound reason why a kiln must be built of heavy material. At the most, it may have to carry a

The added payload earns more for Jaeger owners

Jaeger engineering has eliminated as much as 1600 lbs. dead weight from truck mixers*, cut their loading time to only 10 seconds per yard, shortened discharge time to 20-25 seconds with 4" slump material, only 60 seconds per yard with 1" slump—and cut by 50% the usual time and cost of maintenance.

Hauling full payloads, on faster schedules, Jaeger truck mixers consistently produce more yardage—earn more profit for their owners—and for that reason outnumber all other truck mixers in use today.

**Engineered, not stripped, to save weight.* No reduction in thickness of drums, blades and load-supporting members.

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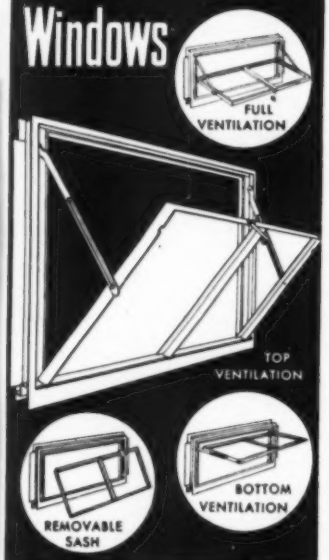

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snow load. The use of heavy masonry has been the cause for many steam curing troubles. The lightest structure of highest insulating value will serve the purpose. Blocks made in such a kiln should approach very closely blocks made in high pressure autoclaves. It should be noted that autoclaves come closer to the ideal kilns than any type in use in block plants.

The answers to problems of steam curing have always been evident, but apparently the block making industry has always been far too busy making block to pay much attention to this particular aspect of the production problem.

Oldest Lime Manufacturer

(*From page* 143)

40. The latter material is brought in by truck on a return-load system, and whenever possible it is fed directly into the plant bins.

Apart from the fact that it produces an important share of the raw materials used in ready-mixed concrete operations, the Corson Company has an additional advantage of even greater significance. It operates one of the best equipped privately owned laboratories in the country for research and production control on lime and related materials. These facilities, and a capable, thoroughly experienced staff of technicians, can be, and will be, used to good advantage in the company's newest venture.

The sales of the concrete company are handled by C. Z. McGinley and Cameron Corson. The production end is handled by E. W. Seltzer. E. D. Stalker is the purchasing agent. Dr. L. John Minnick is the chief chemist. C. C. Fulmer is superintendent, and Clair Dunkelberger is plant engineer. The parent company, G. & W. H. Corson, has been owned and operated by the Corson family continuously since 1822.

Septic Tanks

(*From page* 148)

The production and delivery of septic tanks by the Campbell company involves only two men—one on direct production and the other on deliveries. Since the same man also takes care of the delivery of blocks and other materials, employment in connection with the sale of septic tanks is actually less than two men. By using special equipment developed by the Carpenter company, it is possible for one man to deliver five to six tanks daily.

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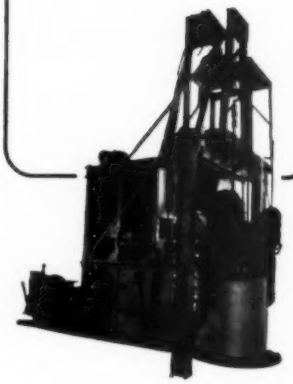

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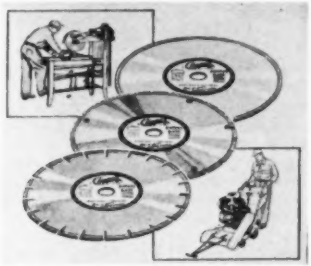
The new blade is adaptable to any type concrete saw and is available to saw any aggregate and age of concrete. Diameters range from 8 to 18 in. and



in thicknesses from 5/32 to 7/64 in. The blades are made by the Clipper Manufacturing Company, 2800 Warwick, Kansas City 8, Mo.

● Sealing Agents

Two new sealing products have been announced by Colprovia Roads, 51 East 42nd Street, New York 17, N. Y.

"Topseal" is a compound for waterproofing all types of surfaces—masonry, wood, metal, concrete, and asphalt. It is applied by brushing and gives a tough film that does not flow in heat, or crack in cold. It is non-combustible.

"Groundseal" is placed over soil to prevent moisture from entering floors and sub-grade areas. This stops corrosion, molds, and odors from entering the basement or sub-floor areas. Both products are available from Colprovia licensees and distributors.

● Horizontal Mixer

Improvements in the horizontal "Moto Mixer" have been incorporated in the new models by the Chain Belt Co., 1600 W. Bruce St., Milwaukee, Wis. Among the improvements are single-strand chain drive for lower maintenance and greater efficiency, drop-forged hardened drum rollers, lighter frame fabricated from alloys, water pump "V"-belt driven from engine crankshaft and improved spouting equipment.

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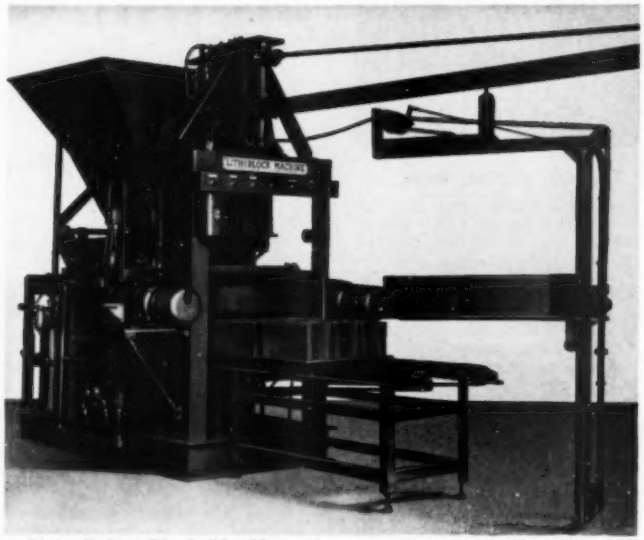

• Plain Pallet Block Machine

No stooping is a feature of the Lith-I-Bar plain pallet three block machine. This machine, the "L-5" is fully automatic and produces 720 eight-in. equivalents an hour. The "no-stoop" off-bearer is a full swiveling, counterbalanced units that permits rack loading and pallet handling from any angle around the machine. The off-bearer is operated from waist-high controls that run the pneumatic motor.

The machine requires only one operator, and as no stooping is required, efficiency is increased and operator fatigue lessened. This machine is manufactured by the Lith-I-Bar Co., Holland, Mich.

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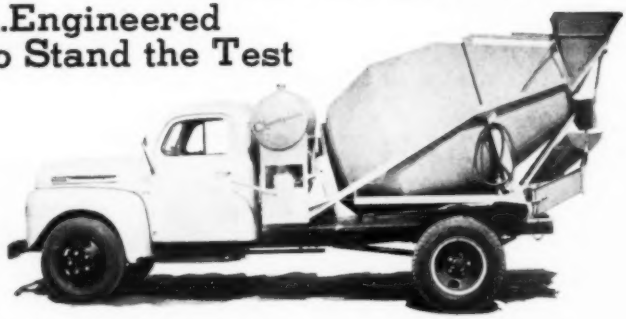

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—4 yd. Imperial weighs only 4,000 lbs. with gross weight of 25,000 lbs. when loaded—properly distributed on of rear wheels.

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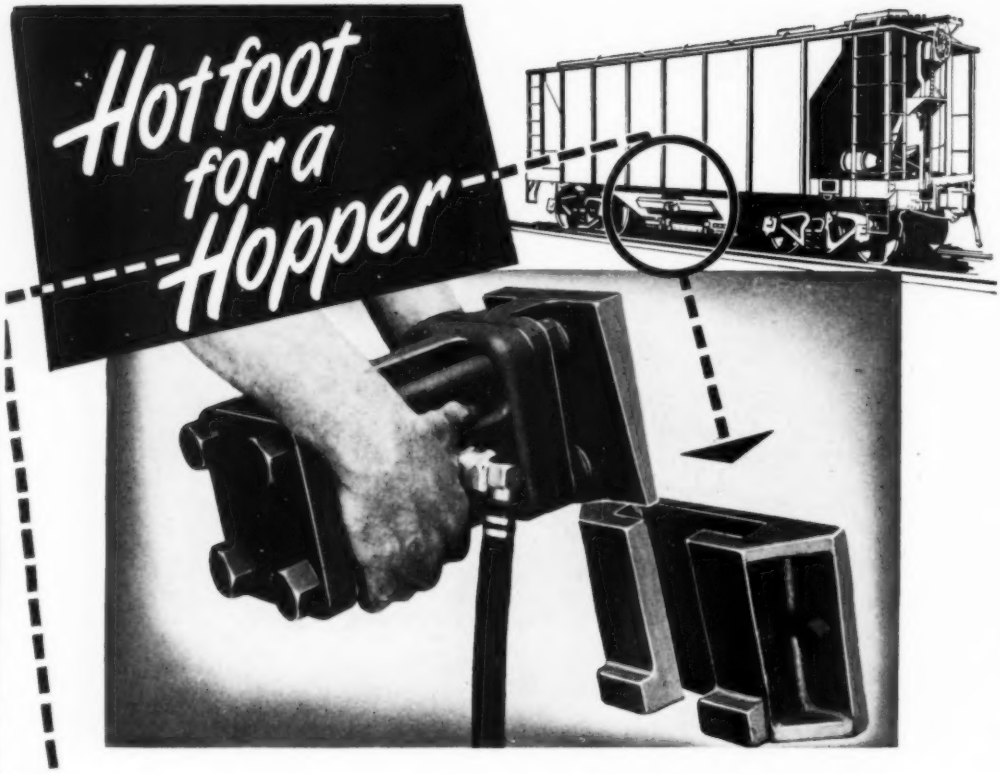

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The Concrete Manufacturer 1952 Buyers' Guide

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CLASSIFIED DIRECTORY

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Calcium Chloride Assn., 1028 Connecticut Ave. N. W., Washington, D. C.

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Truck Mixer Manufacturers Bureau, Washington, D. C.

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ADMIXTURES

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Anti-Hydro Waterproofing Co., 255 Badger Ave., Newark 8, N. J.

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Autolene Lubricants Co., 1331 W. Evans Ave., Denver 9, Colo.

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Calcium Chloride Assn., 909 Ring Bldg., Washington 6, D. C.

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Hopper Products, 12 E. 41st St., New York, N. Y.

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Hydrozo Products, Inc., 2230 University Ave., Madison 5, Wis.

Masonry Concentrates, Inc., Holland, Mich.

Masters Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Oronite Chemical Company, 38 Sansome St., San Francisco, Calif.

Pittsburgh Plate Glass Co., Columbia Chemical Div., 5th Ave. at Belleford, Pittsburgh 13, Penna.

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Reardon Industries, 2837 Stanton Ave., Cincinnati 6, Ohio.

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Solvay Sales Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

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Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Mich.

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Granulite Co., 605 W. Washington St., Chicago 6, Ill.

Great Lakes Carbon Corp., 18 East 48th St., New York 17, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

The Marietta Concrete Corp., Westview, Box 356, Marietta, Ohio.

Poston Brick & Concrete Products Co., Springfield, Ill.

Pumice Aggregate Sales Corp., 121 S. Yale Ave., Albuquerque, New Mex.

Pumice Engineering Co., Bend, Oregon.

Quigley Company, Inc., 527 Fifth Ave., New York 17, N. Y.

The Waylite Company, 105 W. Madison St., Chicago 2, Ill.

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Curtis Pneumatic Machy. Div., Curtis Mfg. Co., 1905 Klenlon Ave., St. Louis 20, Mo.

Davey Compressor Co., Kent, Ohio.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

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Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

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Independent Pneumatic Tool, Aurora, Ill.

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Lynch Corp., 3600 Summit St., Toledo 1, Ohio.

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Quincy Compressor Co., 217 Main St., Quincy, Ill.

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Syntron Co., Homer City, Pa.

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Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

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Continental Gin Co., Industrial Div., P. O. Box 2614, Birmingham, Ala.

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Construction Machy. Co., P. O. Box 358, Waterloo, Iowa.

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Chain Belt Co., 1600 W. Bruce St., Milwaukee, Wis.

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Construction Machy. Co., P. O. Box 358, Waterloo, Ia.

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Supremix, Inc., Adrian, Mich.

Traylor Engineering & Mfg. Co., 10th & Mill Sts., Allentown, Pa.

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Universal Road Machinery Co., Kingston, New York.

Vulcan Iron Works, 700 S. Main St., Wilkes Barre, Pa.

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Butler Bin Co., Waukesha, Wis.

Conveyor Co., Inc., 3620 E. Slauson Ave., Los Angeles 11, Calif.

Erie Steel Const. Co., 67 Geist Road, Erie, Penna.

Fairbanks Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

General Electric Co., 1 River Rd., Schenectady 5, N. Y.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

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Stephens-Adamson Mfg. Co., Aurora, Ill.

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Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

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Cleveland Vibrator Co., 2828 Clinton Ave. W., Cleveland, Ohio.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Robt. Holmes & Bros. Inc., 510-522 Junction Ave., Danville, Ill.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Co., 1960-7th St., Oakland 7, Calif.

The W W. Sly Mfg. Co., 4700 Train Ave., Cleveland 2, Ohio.

Stephens-Adamson Mfg. Co., 7 Ridgeway Ave., Aurora, Ill.

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Webster Mfg. Inc., Tiffin, Ohio.

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Besser Mfg. Co., Alpena, Mich.

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Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 41 Bellview, Columbus 7, Ohio.

Butler Bin Co., Waukesha, Wis.

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Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

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Construction Machy. Co., P. O. Box 358, Waterloo, Iowa.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Dodson Mfg. Co. Inc., 1463 Barwise, Wichita, Kan.

Dravo Corp., Neville Island, Pittsburgh 25, Pa.

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Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

General Engines Co., 307 Hunter St., Gloucester, N. J.

Greenville Mfg. Works, Greenville, Ohio.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Robt. Holmes & Bros. Inc., 512-522 Junction Ave., Danville, Ill.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio.

The Jeffrey Mfg. Co., 935 N. 4th St., Columbus 16, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

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Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio.

Madsen Iron Works, 5631 Bickett St., Huntington Park, Calif.

Marietta Concrete Corp., Marietta, Ohio.

McDermott Bros. Co., Washington St., Allentown, Penna.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

The Neff & Fry Co., Camden, Ohio.

The Nicholson Co., 10 Rockefeller Plaza, New York 20, N. Y.

Noble Company, 1860-7th St., Oakland 20, Calif.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Sakrete Inc., Fischer Ave. & B. & O. RR., St. Bernard, Cincinnati, Ohio.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

Scripps-Pearson Machine Works, P. O. Box 684, Edmonds, Wash.

Simplicity System Co., Riverside Dr., Chattanooga 6, Tenn.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Supremix, Inc., Adrian, Mich.

Universal Engineering Corp., 625 C Ave. N. W., Cedar Rapids, Iowa.

Willard Concrete Machy. Co. Ltd., 2906 Imperial Highway, Lynwood, Calif.

Winslow Scale Co., 25th & Haythorne Ave., Terre Haute, Ind.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

Wittemann Machy. Co., Farmingdale, N. J.

BLADES, MASONRY SAW

Champion Mfg. Co., 2028 Washington, St. Louis 3, Mo.

Clipper Mfg. Co., 2801 Warwick, Kansas City, Mo.

Lee Sales Co., 10439 San Carlos, South Gate, Calif.

Stone Machy. Inc., 1794 N. Salina St., Syracuse, N. Y.

Victor Engineering Corp., 27 Maplewood Ave., Philadelphia 44, Pa.

BLOCK MACHINES

Allied Welding & Mfg. Co., 49 Lorna Doone Blvd., Orlando, Fla.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

J. W. Appley & Son Inc., 831 9th St. N., St. Petersburg 2, Fla.

Brikcrete Associates, Inc., 4651 S. Division Ave., Grand Rapids, Mich.

Besser Mfg. Co., 106-36th St., Alpena, Mich.

Brodersen Industries, 2865 Riverside Dr., Los Angeles 39, Cal.

Geo. E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kan.

Columbia Machine Works, 107 South Grand, Vancouver, Wash.

Concrete Equipment Co., 530 Ottawa Ave., Holland, Mich.

Concrete Pipe Machy. Co., 9th & Division St., Sioux City, Iowa.

Crawford Industries, 1100 East Second St., Pomona, Calif.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Des Plaines Concrete Prod. Machy. Co., 930 North Ave., Des Plaines, Ill.

W. E. Dunn Mfg. Co., Holland, Mich.

Economy Mfg. Co., Stone Mountain, Ga.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Ford Cement Block Co., Cedar Falls, Iowa.

F. C. George Machine Co., 100 S. Westmoreland Dr., Orlando, Fla.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

Hydro-Forged Stone Associates, Inc., 434 Bulkley Bldg., Cleveland, Ohio.

The Kent Machine Co., Cuyahoga Falls, Ohio.

Lifetime Building Specialties, Inc., 519 Brook Haven Dr., Orlando, Fla.

Lith-I-Bar Co., Holland, Mich.

Magic-Concrete Eqpt. Co., 18 Woodland Ave., Winsted, Conn.

Masonry Equipment & Engineering Co., 325 E. Michigan Ave., Three Rivers, Mich.

Miles Manufacturing Co., Jackson, Mich.

Leslie C. Miller Supply Inc., Bedford, Ohio.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Mortarless Machine Corp., 2623 Riverside Drive, Los Angeles, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

D. J. Murray Mfg. Co., Wausau, Wis.

Norris Self-O-Line Block Co., 4 S. 15th St., Philadelphia, Pa.

Gene Olsen Corp., 401 Grace St., Adrian Mich.

Oswalt Engineering Service Corp. Engineering Service), 1335 Circle Ave., Forest Park, Ill.

Petersburg Concrete & Nickelson Supply Co., 2237 E. Bank St., Petersburg, Va.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Prauchak Machine Co., Marshfield, Wis.

Scripps-Pearson Machy. Wks., P. O. Box 684, Edmonds, Wash.

Smith Machine Sales Co., 505-5th Ave., New York, New York.

Stearns Mfg. Co. Inc., Adrian, Mich.

Superior-Liderwood-Mundy Corp., Superior, Wis.

H. R. Sutter Co., 661 Wyoming Ave., Buffalo 15, N. Y.

Twinplex Hydraulics, Inc., 2507 James St., Syracuse 6, N. Y.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Tampers, Inc., 1530 N. Adams St., Peoria, Ill.

Vibra-Tamp Mach. Co., 803 McCormick St., Greensboro, N. C.

Westmont Welding & Mfg. Co., Inc., 344 Haddon Ave., Westmont, N. J.

Wittemann Machinery Co., Farmingdale, N. J.

C. M. Wooten Co., 2717 N. Central Ave., Knoxville 17, Tenn.

BLOCK SPLITTING MACHINES

Split-Rock Products, 13201 W. Burleigh St., Milwaukee 13, Wis.

BOILERS

Babcock & Wilcox Co., 85 Liberty St., New York 6, N. Y.

Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee, Wis.

Combustion Engineering-Superheater, Inc., 1321 N. Branch St., Chicago 22, Illinois.

Consolidated Boiler Corp., 126 Dartmouth St., Boston 16, Mass.

Cyclotherm Corp., 157 E. 157th St., Oswego, New York.

The Dorr Co., 570 Lexington Ave., New York 22, N. Y.

Kewanee Boiler Corp., Kewanee, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio.

McDermott Bros. Co., Washington St., Allentown, Pa.

Manitowoc Engrg. Wks., Manitowoc, Wis.

Siebring Mfg. Co., George, Iowa.

Straub Mfg. Co., 507 Chestnut, Oakland, 7, Calif.

The Wickes Boiler Co., 515 W. Washington Ave., Saginaw, Mich.

William Bros. Boiler & Mfg. Co., 1057-10th Ave., S. E. Minneapolis 14, Minn.

BRICK MACHINES

Besser Mfg. Co., Alpena, Mich.

Brikerete Associates Inc., 4651 S. Division Ave., Grand Rapids, Mich.

W. E. Dunn Mfg. Co., Holland, Mich.

Jackson & Church Co., 321 N. Hamilton St., Saginaw, Mich.

Posey Iron Works Inc., Brick Machy. Div., Lancaster, Pa.

BUCKET LOADERS

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. R. R., Clifton, N. J.

Eagle Crusher Co., Galion, Ohio.

Elmco Corporation, P. O. Box 300, Salt Lake City 8, Utah.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

George Haiss Mfg. Co. Inc., Div. of Pettibone Mulliken Corp., 381 Canal Place, New York, N. Y.

The Frank G. Hough Co., E. Sunnyside Ave., Libertyville, Ill.

Hyster Co., 2926 N. E. Clackamas St., Portland 8, Ore.

The Jeffrey Mfg. Co., 938-99 N. 4th St., Columbus 16, Ohio.

Kent Machine Co., Cuyahoga Falls, Ohio.

Lessmann Mfg. Co., P. O. Box 873, Des moines 4, Iowa.

Link-Belt Co., 300 W. Pershing Road., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

Lull Mfg. Co., 3612 E. 44th St., Minneapolis 6, Minn.

N. P. Nelson Iron Wks., Inc., 820 Bloomfield Ave., Clifton, N. J.

Ottawa Steel Products, Inc., 1st & Walnut, Ottawa, Kan.

Pettibone-Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.

Triangle Engineering Co., 2848 W. 26th St., Chicago 23, Ill.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Truk-Loder Co., 45 Grace St., Tiffin, Ohio.

Western Machy. Co., 760-766 Folsom St., San Francisco 7, Calif.

Willard Concrete Machy. Co. Ltd., 2906 Imperial Highway, Lynwood, Calif.

BUCKETS, CONCRETE

Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio.

Blaw-Knox, Div. of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Construction Machy. Co., P. O. Box 358, Waterloo, Iowa.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. R. R., Clifton, N. J.

Dravo Corporation, Neville Island, Pittsburgh, Penna.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Muller Machinery Co., Inc., Metuchen, New Jersey.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Company, 1860-7th St., Oakland 20, Calif.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

BUCKETS, ELEVATOR

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 38th St., St. Louis 16, Mo.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Baughman Mfg. Co., Jerseyville, Ill.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Chicago Steel Foundry Co., Kedzie Ave., & 37th St., Chicago 32, Ill.

The Columbus Conveyor Co., 869 W. Goodale St., Columbus, Ohio.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. R. R., Clifton, N. J.

Coyle & Roth, 3024 S. E. 4th St., Minneapolis 14, Minn.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Denver Equipment Co., 1400-17th St., Denver, Colo.

Diamond Iron Works, Inc., 1728 N. 2nd St., Minneapolis 11, Minn.

Eagle Crusher Co., Galion, Ohio.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

J. B. Ehrsam & Sons Co., Enterprise, Kansas.

The Elmco Corp., P. O. Box 300, Salt Lake City 8, Utah.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Greenville Mfg. Works, Greenville, Ohio.

Gruendler Crusher & Pulverizer Co., 2915-17 N. Market St., St. Louis, Mo.

George Haiss Mfg. Co., Div. of Pettibone Mulliken Corp., Park Ave. & 143rd St., New York 51, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

Jeffrey Mfg. Co., Columbus 16, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Kent Machine Co., Cuyahoga Falls, Ohio.

Frank A. Kremser & Sons, Inc., 3435 W. 5th Street, Philadelphia 40, Pa.

Link-Belt Co., 300 W. Pershing Road, Chicago 1, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

McLanahan & Stone Corp., 200 Wall St., Hollidaysburg, Pa.

Mosher Electronic Controls, 130 W. 42nd St., New York 18, New York.

Multiplex Machinery Corp., Elmore, Ohio.

National Malleable & Steel Castings Co., 10600 Quincy Ave., Cleveland, Ohio.

N. P. Nelson Iron Works, Inc., 820 Bloomfield Ave., Clifton, N. Y.

Noble Company, 1860-7th St., Oakland 20, Calif.

Northern Conveyor Co., Janesville, Wis.

Pettibone-Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

Praschak Machine Co., Marshfield, Wis.

Robins Conveyors, Div. Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N. J.

Rogers Iron Works Co., 10th & Pearl Sts., Joplin, Mo.

Smith Engineering Works, 532 E. Capitol Dr., Milwaukee 12, Wis.

Sprout, Waldron & Co. Inc., Muncy, Pa.

Standard Metal Mfg. Co., Malinta, Ohio.

Stephens-Adamson Mfg. Co., Aurora, Ill.

CLASSIFIED DIRECTORY

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Supremix, Inc., Adrian, Mich.

Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Traylor Engineering & Mfg. Co., 10th & Mill St., Allentown, Pa.

Triangle Engineering, 2948 W. 26th St., Chicago, Ill.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Universal Engineering Corp., 625 "C" Ave. N. W., Cedar Rapids, Iowa.

Universal Road Machinery Co., Kingston, New York.

Webster Mfg. Inc., Tiffin, Ohio.

Western Machinery Co., 760 Folsom St., San Francisco, Calif.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

Witteman Machinery Co., Farmingdale, N. J.

BUGGIES, CONCRETE

Construction Machinery Co., Box 358, Waterloo, Iowa.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kwik-Mix Co., Port Washington, Wis.

Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 39, Calif.

BULK CEMENT HANDLING EQUIPMENT

Atlas Conveyor Co., Box 59-B, Clintonville, Wis.

The C. O. Bartlett & Snow Co., 6200 Harvard Ave., Cleveland 5, Ohio.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Blaw-Knox, Co., Farmers Bank Bldg., Pittsburg 22, Penna.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Butler Bin Co., Waukesha, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles, Calif.

Dravo Corporation, Neville Island, Pittsburgh, Penna.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kan.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Fuller Company, Fuller Bldg., Catasauqua, Penna.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Hardinge Co., Inc., 240 Arch St., York, Penna.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Holly Pneumatic Systems, Inc., 15 E. 40th St., New York, N. Y.

The Frank G. Hough Co., E. Sunnyside Ave., Libertyville, Ill.

Howe Scale Co., 3-13 Scale Ave., Rutland, Vt.

Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Kent Machine Co., Cuyahoga Falls, Ohio.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell, Milwaukee 14, Wis.

Madsen Iron Works, 5631 Bickett St., Huntington Park, Calif.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Company, 1860—7th St., Oakland 20, Calif.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Robins Conveyors Div., Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Robinson Air Activated Conveyor Systems, Div. of Morse Boulger Destructor Co., 211-G East 42nd St., New York 17, N. Y.

Silent Hoist & Crane Co., Inc., 841-65 63rd St., Brooklyn 20, N. Y.

Sprout, Waldron & Co., Inc., Muncy, Pa.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Supremix, Inc., Adrian, Mich.

Syntron Co., 385 Carson, Homer City, Pa.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Webster Mfg., Inc., Tiffin, Ohio.

BULK CEMENT STORAGE PLANTS

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 38th St., St. Louis 16, Mo.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Bethlehem Steel Co., 701 E. 3rd St., Bethlehem, Penna.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Butler Bin Co., Waukesha, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Madsen Iron Works, 5631 Bickett St., Huntington Park, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

The Neff & Fry Co., Camden, Ohio.

The Nicholson Co., 10 Rockefeller Plaza, New York 20, N. Y.

Noble Company, 1860-7th St., Oakland 20, Calif.

Stephens-Adamson Mfg. Co., Aurora, Ill. 20, Calif.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Supremix, Inc., Adrian, Mich.

BULK CEMENT TRUCKS

Baughman Mfg. Co., Jerseyville, Ill.

Fruehauf Trailer Co., Detroit, Mich.

Gramm Trailer Corp., Delphos, Ohio.

Highway Trailer Company, Edgerton, Wisc.

CAR PULLERS

American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn.

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Clyde Iron Works, Inc., 29th Ave. W. & Michigan St., Duluth 1, Minn.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Dobbie Foundry & Machine Co., 146-170 Portage Rd., Niagara Falls, New York.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kan.

Robt. Holmes & Bros., Inc., 512-522 Junction Ave., Danville, Ill.

The Jeffrey Mfg. Co., Columbus, 16, Ohio.

W. A. Jones Foundry & Machinery Co., 4401 Roosevelt Rd., Chicago 24, Ill.

Joy Mfg. Co., Dept. 24, Henry W. Oliver Bldg., Pittsburgh 22, Penna.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Silent Hoist & Crane Co., Inc., 841-65 63rd St., Brooklyn 20, N. Y.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

Webster Mfg., Inc., Tiffin, Ohio.

CARS, CONCRETE PRODUCTS

American Car Foundry Co., 30 Church St., New York 8, N. Y.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

W. E. Dunn Mfg. Co., 23 W. 24th St., Holland, Mich.

Easton Car & Construction Co., Easton, Penna.

Pressed Steel Car Co., Inc., 2500 Koppers Bldg., Pittsburgh 30, Pa.

H. K. Porter Co., Inc., Oliver Bldg., Pittsburgh 22, Pa.

Sullivan Company, 212 E. Trigg Ave. Memphis 2, Tenn.

CAR SHAKERS

National Conveyor & Supply Co., 350 N. Harding Ave., Chicago 24, Ill.

New Haven Vibrator Co., 160 Chestnut St., New Haven 7, Conn.

Syntron Co., Homer City, Penna.

The Cleveland Vibrator Co., 2828 Clinton Ave. W., Cleveland, Ohio.

CEMENT, AIR ENTRAINING

Lehigh Portland Cement Co., 718 Hamilton St., Allentown, Penn.

Lone Star Cement Corp., 100 Park Ave., New York 17, N. Y.

Marquette Cement Mfg. Co., 20 N. Wacker Drive, Chicago 6, Ill.

Medusa Portland Cement Co., 1000 Midland Bldg., Cleveland 15, Ohio.

Pennsylvania-Dixie Cement Corp., 60 E. 42nd St., New York 17, N. Y.

Trinity Division, General Portland Cement Co., 1618 Republic Bank Bldg., Dallas 1, Texas.

Universal-Atlas Cement Co., 135 E. 42nd St., New York 17, N. Y.

CINDER GRINDERS

W. A. Riddell Corp., Bucyrus, Ohio.

CINDERS, PROCESSED

Foreston Coal Company, Inc., 500 Fifth Ave., New York, N. Y.

Cinder Shippers (Formerly H. Hessey Miller), Chester, Pa.

CLAMPS, FORM

Adjustable Clamp Co., 417 N. Ashland Ave., Chicago 22, Ill.

Star Expansion Products Co., 147-149 Cedar St., New York 6, N. Y.

Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.

Universal Concrete Pipe Co., Inc., 297 South High St., Columbus, Ohio.

Williams Form Engrg. Corp., Box 324, Madison Sq. Sta., Grand Rapids, Mich.

COLORS, CEMENT AND MORTAR

Blue Ridge Talc Co., Henry, Va.

The Burns & Russell Co., 403 Tower Bldg., Baltimore 2, Md.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Landers-Segal Color Co., 78 Delavan St., Brooklyn 31, N. Y.

Lasting Products Co., 200 S. Franklintown Rd., Baltimore 23, Md.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Mineral Pigments Corp., Muirkirk, Md.

Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.

Penn Crete Products Co., 20th & Lippincott Sts., Philadelphia 32, Pa.

Reardon Industries, Inc., 2837 Stanton Ave., Cincinnati 6, Ohio.

Reichard-Coulston, Inc., 15 E. 26th St., New York 10, N. Y.

Ricketson Mineral Color Works, 229 E. Wisconsin Ave., Milwaukee, Wis.

Smith Chemical & Color Co., 55 John St., Brooklyn, N. Y.

J. Lee Smith & Co., Inc., 25 Ann St., New York 7, New York.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Sparkle-Crete Co., 20 N. LaSalle St., Chicago 2, Ill.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.

C. K. Williams & Co., 640 N. 13th St., Easton, Penna.

CONCRETE CONTROL SYSTEMS

Automatic Liquid Meter Co., 1372-1378 E. 15th St., Los Angeles 21, Calif.

Carlyle Rubber Co., 64 Park Place, New York 7, N. Y.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

M & M Engineering Corp., 3928 Millersville Dr., Indianapolis 5, Ind.

Neptune Meter Co., 50 West 50th St., New York 20, N. Y.

Rainhart Company, 602-8 W. 34th St., Austin 21, Texas.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

CONVEYORS, BELT

Allied Welding & Mfg. Co., 49 Lorna Doone Blvd., Orlando, Fla.

American Conveyor Co., 1115 W. Adams St., Chicago 7, Ill.

Atlas Conveyor Co., Box 59B, Clintonville, Wis.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Barber-Greene Co., 631 W. Park Ave., Aurora, Ill.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Bended Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Columbus Conveyor Co., 862 W. Goodale Blvd., Columbus 8, Ohio.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Continental Gin Co., Industrial Div., P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. & W. R.R., Clifton, N. J.

Coyle & Roth, 3024 S. E. 4th St., Minneapolis 14, Minn.

Denver Equipment Co., 1400—17th St., Denver, Colo.

Eagle Crusher Co., Galion, Ohio.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kansas.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

A. B. Farquhar Co., Conveyor Div., N. Duke St., York, Penna.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

Goodall Rubber Co., 5 S. 36th St., Philadelphia, Pa.

Goodman Mfg. Co., 4834 S. Halsted, Chicago 9, Ill.

Greenville Mfg. Wks., Greenville, Ohio.

George Haiss Mfg. Co., Inc., Div. of Pettibone Mulliken Corp., 381 Canal Pl., New York, N. Y.

The Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Houston Concrete Machinery Co., 114 Heights Blvd., Houston 7, Texas.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

The Jeffrey Mfg. Co., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Joy Mfg. Company, Dept. 24, Henry W. Oliver Bldg., Pittsburgh 22, Penna.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Kent Machine Co., Cuyahoga Falls, Ohio.

Lake Shore Engineering Co., Iron Mountain, Mich.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Wks., 4603 W. Mitchell St., Milwaukee 4, Wis.

The Manhattan Rubber Mfg. Co., Div. of Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.

E. F. Marsh Engineering Co., 4030 Chateau Ave., St. Louis 10, Mo.

McLanahan & Stone Corp., 200 Wall St., Hollidaysburg, Pa.

The McNally-Pittsburg Mfg. Corp., Pittsburg, Kansas.

Noble Company, 1860—7th St., Oakland 20, Calif.

Northern Conveyor Co., Janesville, Wis.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Praschak Machine Co., Marshfield, Wis.

Republic Rubber Co., Youngstown, Ohio.

Robins Conveyors Div. Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Rogers Iron Works Co., 10th & Pearl St., Joplin, Mo.

Smith Machine Sales Co., 505—5th Ave., New York, N. Y.

Smith Engineering Works, 532 E. Capitol Dr., Milwaukee 12, Wis.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Straub Mfg. Co., Inc., 507 Chestnut St., Oakland 7, Calif.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Sprout, Waldron & Co., Inc., Muncy, Pa.

Transall, Inc., 109 North 11th St., Birmingham, Alabama.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

Universal Engineering Corp., 625 "C" Ave. N.W., Cedar Rapids, Iowa.

Webster Mfg. Inc., Tiffin, Ohio.

West Bend Equipment Co., West Bend, Wis.

Willard Concrete Machy., Ltd., 2906 Imperial Highway, Lynwood, Calif.

Wisconsin Fdry. & Mach. Co., 623 E. Main St., Madison 1, Wis.

Wittemann Machy. Co., Farmingdale, N. J.

CONVEYORS, PORTABLE

American Conveyor Co., 1115 W. Adams St., Chicago 7, Ill.

Atlas Conveyor Co., Box 59B, Clintonville, Wis.

Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.

Barber-Green Co., 631 W. Park Ave., Aurora, Ill.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. & W. RR., Clifton, N. J.

Coyle & Roth, 3024 S. E. 4th St., Minneapolis 14, Minn.

Diamond Iron Works, Inc., 1728 N. 2nd St., Minneapolis 11, Minn.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

A. B. Farquhar Co., Conveyor Division, N. Duke St., York, Penna.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

George Haiss Mfg. Co., Inc., Div. of Pettibone Mulliken Corp., 381 Canal Place, New York, N. Y.

Hercules Steel Products Co., Galion, Ohio.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Lake Shore Engineering Co., Iron Mountain, Mich.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Wks., 4603 W. Mitchell St., Milwaukee 14, Wis.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass.

E. F. Marsh Engineering Co., 4030 Chateau Ave., St. Louis 10, Mo.

N. P. Nelson Iron Works, Inc., 320 Bloomfield Ave., Clifton, N. J.

Northern Conveyor Co., Janesville, Wis.

Pioneer Engineering Wks., Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn.

Rogers Iron Works Co., 10th & Pearl Sts., Joplin, Mo.

Robins Conveyors, Inc., Div Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Trowbridge Conveyor Co., 850 Van Houten Ave., Clifton, N. J.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Engineering Corp., 625 "C" Ave. N. W., Cedar Rapids, Iowa.

The Wilkie Company, 1104 Packard Bldg., Philadelphia, Pa.

Willard Concrete Machy. Co., Ltd., 2906 Imperial Highway, Lynwood, Calif.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

CONVEYORS, SCREW

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Alpha Tank & Sheet Metal Mfg. Co., 5007 S. 38th St., St. Louis 16, Mo.

Atlas Conveyor Co., Box 59B, Clintonville, Wis.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Brady Conveyors Corp., 20-A W. Jackson Blvd., Great Northern Bldg., Chicago, Ill.

Butler Bin Co., Waukesha, Wis.

Cement Mill Equipment Co., Box 124, Franklin, Mich.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Conveyor Engineering & Supplies Corp., Hobart Pl. & D. L. W. RR., Clifton, N. J.

Continental Gin Co., Industrial Division, P. O. Box 2614, Birmingham 2, Ala.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Chicago Steel Foundry Co., 3720 S. Kedzie Ave., Chicago 32, Ill.

Denver Equipment Co., 1400—17th St., Denver, Colo.

Eagle Iron Works, 129 Holcomb Ave., Des Moines, Iowa.

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kans.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

General Conveyor & Mfg. Co., 3601 Salena St., St. Louis 18, Mo.

Greenville Mfg. Works, Greenville, Ohio.

Hardinge Co., Inc., 240 Arch St., York, Penna.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

The Jeffrey Mfg. Co., 935-99 N. 4th St., Columbus 16, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

The McNally-Pittsburg Mfg. Corp., Pittsburg, Kansas.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

D. J. Murray Mfg. Co., Wausau, Wis.

Noble Company, 1860—7th St., Oakland 20, Calif.

Screw Conveyor Corp., 700 Hoffman St., Hammond, Ind.

Sprout, Waldron & Co., Inc., Muncy, Penna.

Stephens-Adamson Mfg. Co., Aurora, Ill.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Supremix, Inc., Adrian, Mich.

Webster Mfg., Inc., Tiffin, Ohio.

Wisconsin Foundry & Machine Co., 623 E. Main St., Madison 1, Wis.

CURING ROOM DOORS

Universal Door Carrier, Inc., 1117 Cornell Ave., Indianapolis 2, Ind.

CURING ACCELERATORS

Campion Fuel Engrg. Co., P. O. Box 3941, Detroit 27, Mich.

Dri-Fast Process Corp., P. O. Box 13, Rahway, N. J.

Roy D. Emmons, 303 Melrose Ave., Syracuse, N. Y.

D. J. Murray Mfg. Co., Wausau, Wis.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

CURING AGENTS

Anti-Hydro Waterproofing Co., 365 Badger Ave., Newark 8, N. J.

Autolene Lubricants Co., 1331 W. Evans Ave., Denver 9, Colo.

Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Pa.

Calcium Chloride Assn., 909 Ring Bldg., Washington 6, D. C.

Carter-Waters Corp., 2440 Penway, Kansas City, Mo.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass.

Dow Chemical Co., Midland, Mich.

E. I. DuPont De Nemours & Co., Nemours Bldg., Wilmington 98, Delaware.

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Masters Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Reardon Industries, 2837 Stanton Ave., Cincinnati 6, Ohio.

Spray-O-Bond, 2225 N. Humboldt Ave., Milwaukee 12, Wis.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Mich.

Wyandotte Chemicals Corp., Michigan Alkali Div., Wyandotte, Mich.

CURING EQUIPMENT

Aluminum Products Corp., Pontiac, Mich.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

Dri-Fast Process Corp., P. O. Box 13, Rahway, N. J.

Roy D. Emmons, 303 Melrose Ave., Syracuse, N. Y.

Jackson & Church Co., 321 North Hamilton St., Saginaw, Michigan.

Lith-I-Bar Co., Holland, Mich.

Littleford Bros., Inc., 452 E. Pearl St., Cincinnati, Ohio.

Shore Engineering, 320 Broadway, New York, N. Y.

Truscon Laboratories Inc., 1640 Caniff Ave., Detroit 11, Michigan.

DISPERSING AGENTS

American Fluresit Co. Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Dewey & Almy Chemical Co., Cambridge 40, Mass.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Reardon Industries, Inc., 2837 Stanton Ave., Cincinnati 6, Ohio.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

Spray-O-Bond, 2225 N. Humboldt Ave., Milwaukee 12, Wis.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Reardon Industries, 2837 Stanton Ave., Cincinnati 6, Ohio.

DUST COLLECTORS

American Air Filter Co., First & Central Ave., Louisville 8, Ky.

American Blower Corp., 8111 Tireman Blvd., Detroit 32, Mich.

American Wheelabrator & Equipment Corp., 439 S. Byrkit St., Mishawaka, Ind.

Buell Engrg. Co., 70 Pine St., New York 5, N. Y.

Iowa Manufacturing Co., Cedar Rapids, Iowa.

Kennedy-Van Saun Mfg. & Engr. Corp., 2 Park Ave., New York 16, N. Y.

Madsen Iron Works, 5631 Bickett, Huntington Pk., Cal.

Multiplex Machinery Corp., Elmore, Ohio.

Northern Blower Co., 6409 Barberton Ave., Cleveland 2, Ohio.

Pangborn Corp., Hagerstown, Md.

Parsons Engr. Corp., 2545 E. 79th St., Cleveland, Ohio.

W. W. Sly Mfg. Co., 4745 Train Ave., Cleveland, Ohio.

Smidth & Co., F. L., 11 W. 42nd St., New York 18, N. Y.

Western Precipitation Corp., 1016 W. 9th St., Los Angeles 15, Calif.

FLOORING SYSTEMS

American Fluresit Co. Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

Basalt Rock Co., Inc., Stresterete Division, Napa, Calif.

Besser Mfg. Co., Alpena, Mich.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Flexicore Co. Inc., 220 E. 42nd St., New York, N. Y.

Lith-I-Bar Co., Joistile Div., Holland, Mich.

FORKS, GRIPPING

Lewis-Shepard Sales Corp., 158 Walnut St., Watertown, Mass.

Tracto-Lift Company, 2007 Baltimore, Kansas City, Mo.

Schmidgall Mfg. Co., Fork Division, 307 Cass St., Peoria, Ill.

FORMS, BURIAL VAULT

American Vault Co., 579 Kenilworth Ave., Detroit, Mich.

Ashland Vault Co. Inc., 500-518 Virginia Ave., Ashland, Ohio.

Berg Vault Co., 1620 Lucas Hunt Rd., St. Louis, Mo.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

Wilbert W. Haase Co., 1005 Troost Ave., Forest Park, Ill.

Norwalk Vault Co., Woodlawn Ave., Norwalk, Ohio.

Richmond Burial Vault Co., 2081 Richmond Terrace, Port Richmond, L. I., N. Y.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Wm. E. Whited, Oak Hill Memorial Park, Escondido, Calif.

FORMS, COATING

A. C. Horn Co., Inc., 10th St. & 44th Ave., Long Island City 1, N. Y.

Sullivan Co., 212 E. Trigg Ave., Memphis 2, Tenn.

Truscon Laboratories, 1640 Caniff Ave., Detroit 11, Mich.

FORMS, COMPOUND

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Homeward Steps Co., 3420 W. 9th St., Des Moines, Iowa.

FORMS, CRIBBING

Baker-Roos, Inc., 602 W. McCarty St., Indianapolis 6, Ind.

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Universal Concrete Pipe Co., 397 S. High St., Columbus, Ohio.

FORMS, CURB & GUTTER

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, FIREPLACE

General Engines Co., 307 Hunter St., Gloucester, N. J.

Henkin Industries, 171 Monroe, Memphis, Tenn.

Edward Lehn, 3738 W. Lapham St., Milwaukee, Wis.

FORMS, FLAT SLAB

Aetna Plywood & Veneer Co., 1751 Elston Ave., Chicago 22, Ill.

Baker-Roos, Inc., 602 W. McCarty St., Indianapolis 6, Ind.

Bethlehem Steel Co., 701 E. 3rd St., Bethlehem, Penna.

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Blaw-Knox, Div. of Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Penna.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Price Bros. Co., Box 825, Dayton, Ohio.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 15, Ill.

FORMS, FLOOR AND ROOF SLABS

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

The Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio.

Greenville Mfg. Works, Greenville, Ohio.

Price Bros. Co., Box 825, Dayton, Ohio.

Sakrete Inc., Fischer Ave. & B. & O. R.R., St. Bernard, Cincinnati 17, Ohio.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Westbilt, Inc., 93 Tiffany Blvd., Newark 4, N. J.

FORMS, GARBAGE RECEPTACLE

Curriers Enterprises, 4303 San Fernando Rd., Glendale 4, Calif.

Norwalk Vault Co., Woodlawn Ave., Norwalk, Ohio.

Sani-Bin Corp., 338 Scajaquada St., Buffalo 11, N. Y.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, GARDEN FURNITURE

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Greenville Mfg. Works, Greenville, Ohio.

R. K. Tyra Company, P. O. Forest Lake, Tyra, Minn.

FORMS, GREASE TRAP

Homeward Steps Co., 3420 W. 9th St., Des Moines, Iowa.

Houston Concrete Machinery Co., 114 Heights Blvd., Houston 7, Texas.

CLASSIFIED DIRECTORY

FORMS, JOIST

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Greenville Mfg. Works, Greenville, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Lith-I-Bar Co., Joistile Div., Holland, Mich.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, LAUNDRY TRAY

Chicago Granitine Mfg. Co., 4920 S. Rockwell St., Chicago 32, Ill.

Wessels Co., 1625 E. Euclid Ave., Detroit, Mich.

FORMS, MANHOLE COVER AND FRAME

Binghamton Metal Forms, Inc., 15-21 Griswold St., Binghamton, N. Y.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Price Bros. Co., Box 825, Dayton, Ohio.

Quinn Wire & Iron Works, East 12th St., Boone, Iowa.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, ORNAMENTAL CONCRETE

Automatic Spring Coiling Co., 4045 W. Thorndale Ave., Chicago 30, Ill.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

General Engines Co., 307 Hunter St., Gloucester, N. J.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, PARK BENCH—CONCRETE

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

FORMS, PIPE

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Concrete Pipe Machinery Co., 9th & Division Sts., Sioux City 9, Iowa.

Eckel Engineering Co., 193 South 1st St., San Jose, Calif.

Houston Concrete Machy. Co., 114 Heights Blvd., Houston, Texas.

Martin Iron Works, P. O. Box 2257, Terminal Annex, Los Angeles, Calif.

Price Bros Co., Box 825, Dayton, Ohio.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 3034, Knoxville, Tenn.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

William Bros. Boiler & Mfg. Co., 1057 10th Ave. S. E., Minneapolis 14, Minn.

Zeidler Concrete Prod. Machy. Co., Newell & Mobile Sts., Waterloo, Iowa.

FORMS, SEPTIC TANK

Ashland Vault, Inc., 500-518 Virginia Ave., Ashland, Ohio.

Berg Vault Co., 1620 Lucas Hunt Rd., St. Louis, Mo.

Carpenter Mfg. Co., R. F. D. No. 1, Box 470, Richmond, Va.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Greenville Mfg. Works, Greenville, Ohio.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Houston Concrete Machy. Co., 114 Heights Blvd., Houston, Texas.

Norwalk Vault Co., Woodlawn Ave., Norwalk, Ohio.

Quinn Wire & Iron Co., E. 12th St., Boone, Iowa.

Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

FORMS, SPECIAL ORDER—(MISC.)

Edward Campbell Co., S. E. Corner East & Walnut Rd., Vineland, N. J.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

FORMS, SPLASH BLOCK

Edward Campbell Co., S. E. Corner East & Walnut Rd., Vineland, N. J.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Homeward Steps Co., 3420 W. 9th St., Des Moines, Iowa.

FORMS, STEP

Edward Campbell Co., S. E. Corner East & Walnut Rd., Vineland, N. J.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Homeward Steps Co., 3420 W. 4th St., Des Moines, Iowa.

Kirk & Blum Mfg. Co., 2807 Spring Grove Ave., Cincinnati 25, Ohio.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

FORMS, WELL CURBING

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Kirk & Blum Mfg. Co., 2807 Spring Grove Ave., Cincinnati 25, Ohio.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

GLOVES, WORK

Edmont Mfg. Co., 532 Orange St., Coshocton, Ohio.

General Scientific Equipment Co., 27th & Huntington Sts., Philadelphia 32, Penna.

GUNS, COLOR SPRAY

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Curtis Pneumatic Machy., Div. of Curtis Mfg. Co., 1905 Klenlen Ave., St. Louis 20, Mo.

The DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

Spray Engineering Co., 114 Central St., Somerville 45, Mass.

GUNS, CONCRETE PLACING

Air Placement Equipment Co., 2525 Southwest Blvd., Kansas City 8, Mo.

Cement Gun Co., 1520 Walnut St., Allentown, Pa.

Vita Labor Saving Tools, Inc., Station Plaza, Smithtown Branch, N. Y.

GUNS, GROUT AND CAULKING

Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Penna.

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Posey Iron Works, Inc., Brick Machinery Div., Lancaster, Pa.

Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.

HARDENING AGENTS

American Fluresit Co., Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

Anti-Hydro Waterproofing Co., 265 Badger Ave., Newark 8, N. J.

Atlantic Chemicals, Inc., P. O. Box 3466, Orlando, Fla.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Curtis Pneumatic Machy., Div. of Curtis Mfg. Co., 1905 Klenlen Ave., St. Louis 20, Mo.

Dow Chemical Co., Midland, Michigan.

E. I. DuPont De Nemours & Co., Nemours Bldg., Wilmington 98, Del.

Harshaw Chemical Co., Cleveland, Ohio.

Haynes Products Co., 4007 Farnum St., Omaha 3, Nebr.

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Reardon Industries, Inc., 2337 Stanton Ave., Cincinnati 6, Ohio.

Solvay Sales Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Spray-O-Bond Co., 2225 N. Humboldt Ave., Milwaukee 12, Wis.

Stonhard Company, 1306 Spring Garden St., Philadelphia 23, Pa.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

CLASSIFIED DIRECTORY

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Mich.

Wyandotte Chemicals Corp., Michigan Alkali Div., Wyandotte, Mich.

HEATERS, CONCRETE MIXER

Aeroil Burner Co., Inc., 13th St. & Park Ave., West New York, N. J.

Hauck Mfg. Co., 126 10th St., Brooklyn 15, N. Y.

Littleford Bros., Inc., 453 E. Pearl St., Cincinnati, Ohio.

HOISTING EQUIPMENT, CONCRETE

Curtis Pneumatic Machy. Div. of Curtis Mfg. Co., 1905 Klenlen Ave., St. Louis 20, Mo.

Dodson Mfg. Co., Inc., 1463 Barwise, Wichita 2, Kans.

Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio.

F. C. George Machine Co., 100 S. Westmoreland Dr., Orlando, Fla.

Hyster Co., 2936 N. E. Clackamas St., Portland 8, Ore.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Kwik-Mix Co., Port Washington, Wis.

Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis.

Lewis-Shepard Products, Inc., 158 Walnut St., Watertown 72, Mass.

Marvel Equipment Co., 224 S. Michigan Ave., Chicago 4, Ill.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Mishco Corp., 615 S. W. 2nd Ave., Miami 36, Florida.

Mixermobile Mfrs., 6855 N. E. Halsey St., Portland 16, Oregon.

Muller Machinery Co., Inc., Metuchen, N. J.

Superior-Lidgerwood-Mundy Corp., Superior, Wis.

Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 15, Penna.

JOIST AND SLAB MACHINES

Besser Mfg. Co., Alpena, Mich.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

W. E. Dunn Mfg. Co., Holland, Mich.

Greenville Mfg. Works, Greenville, Ohio.

The Kirk & Blum Mfg. Co., 2807 Spring Grove Ave., Cincinnati 25, Ohio.

The Lith-I-Bar Co., Holland Evening Sentinel Bldg., Holland, Mich.

Mishco Corp., 615 S. W. 2nd Ave., Miami 36, Florida.

Multiplex Machinery Corp., Elmore, Ohio.

KILNS, CONCRETE CURING

Dri-Fast Process Corp., P. O. Box 13, Rahway, N. J.

Hardinge Co., Inc., 240 Arch St., York, Penna.

Jackson & Church, 321 N. Hamilton St., Saginaw, Mich.

F. L. Smidth & Co., 11 W. 42nd St., New York 18, N. Y.

LIFT TRUCKS

1. Electric
2. Gas
3. Handlift

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio. 3.

The Atlas Car & Mfg. Co., 1100 Ivanhoe Rd., Cleveland 10, Ohio. 1. 2. 3.

Automatic Transportation Co., 101 W. 87th St., Chicago, Ill. 1. 2. 3.

Baker Industrial Truck, Div. of The Baker-Raulang Co., 2168 W. 25th St., Cleveland 13, Ohio. 1. 2. 3.

Barrett-Cravens Co., 4629 S. Western Blvd., Chicago 9, Ill. 1, 2, 3.

Buda Company, Harvey, Ill. 1.

Clark Tructractor Div., Clark Equipment Co., Battle Creek, Mich. 1. 2. 3.

Easton Car & Construction Co., Easton, Penna. 2.

Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio. 1. 2. 3.

Erickson Power Lift Trucks, Inc., 1401 Marshall St. N. E., Minneapolis 13, Minn. 2.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo. 2.

Gerunger Carrier Co., Dallas, Ore. 2.

Henneuse Engrg. Co., 400 Monroe St., Marion, Ohio.

The Frank G. Hough Co., E. Sunnyside Ave., Libertyville, Ill. 2.

Hyster Company, 2926 N. E. Clackamas St., Portland 8, Ore. 2.

Kwik-Mix Co., Port Washington, Wis. 2.

Lewis-Shepard Sales Corp., 158 Walnut St., Watertown, Mass. 2.

Lift Trucks Inc., 2425 Spring Grove Ave., Cincinnati 14, Ohio. 1. 2. 3.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass. 1.

Milwaukee Power Equipment Co., 525 N. 22nd St., Milwaukee 3, Wis. 2.

Mixermobile Mfrs., 6855 N. E. Halsey St., Portland 16, Ore. 2.

Praschak Machine Co., Marshfield, Wis. 2, 3.

Powers Equipment Mfg. Co., 512 Monroe St., Anoka, Minn. 2.

Ross Carrier Co., 250 Miller St., Benton Harbor, Mich. 2.

Schmidgall Mfg. Co., Fork Division, 307 Cass St., Peoria, Ill. 1. 2.

Service Caster & Truck Corp., 110 S. Superior St., Albion, Mich. 2.

Silent Hoist & Crane Co. Inc., 841-65 63rd St., Brooklyn 20, N. Y. 2.

Stearns Mfg. Co., Adrian, Mich. 2.

Towmotor Corp., 1226 E. 142nd St., Cleveland 10, Ohio. 1. 2. 3.

Transitier Truck Co., 2477 N. W. 23rd Ave., Portland 10, Ore. 2.

Truckman Div., The Knickerbocker Co., 571 Liberty Ave., Jackson, Mich. 2.

West Bend Equipment Corp., West Bend, Wis. 3.

Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 15, Penna. 1. 2. 3.

LIME PUTTY MACHINERY

Miller-Komline Corp., Peapack, N. J.

LINTEL MACHINES

Kent Machine Co., Cuyahoga Falls, Ohio.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

MASONRY SUPPLIES—MISC.

(Anchor Inserts, Expansion Shields & Bolts, Drills, Etc.)

Precision Devices, Inc. (Formerly: Star Expansion Prods. Co.), 147 Cedar St., New York, N. Y.

METERS, WATER

The Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

Builders-Providence Inc., 9 Codding St., Providence 1, R. I.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

General Electric Co., 1 River Rd., Schenectady 5, N. Y.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.

Spangler Valve Div., Aircraft Fueling Co. Inc., 1535 E. 16th St., Los Angeles 21, Calif.

Westinghouse Electric & Mfg. Co., E. Pittsburgh, Penna.

Worthington Pump & Machy. Corp., Harrison & Worthington Aves., Harrison, N. J.

METERS, SAND MOISTURE

Rainhart Company, 602-8 W. 34th St., Austin 21, Tex.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

Spangler Valve Div., Aircraft Fueling Co. Inc., 1535 E. 16th St., Los Angeles 21, Calif.

Valley Ready Mix Concrete Co., Harlingen, Tex.

MIXERS, CONCRETE (BATCH)

Allied Welding & Mfg. Co., 49 Lorna Doone Blvd., Orlando, Fla.

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Bergen Machine & Tool Co. Inc., 189 Franklin Ave., Nutley 10, N. J.

Besser Manufacturing Co., Alpena, Mich.

Brikerete Associates Inc., 4651 S. Division Ave., Grand Rapids, Mich.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Concrete Equipment Co., 530 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

George E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kan.

Construction Machy. Co., Glenwood & Vinton Sts., Waterloo, Iowa.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Denver Equipment Co., 1400 17th St., Denver, Colo.

Dodson Mfg. Co. Inc., 1463 Barwise, Wichita 2, Kans.

W. E. Dunn Mfg. Co., Holland, Mich.

CLASSIFIED DIRECTORY

Chas. Gatzke Mfg. Co., 930 North Ave., Des Plaines, Ill.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

F. C. George Machine Co., 100 So. Westmoreland Dr., Orlando, Fla.

Gilson Bros. Co., Fredonia, Wis.

Henneuse Engrg. Co., 400 Monroe St., Marion, Ohio.

Houston Concrete Machinery Co., 114 Heights Blvd., Houston 7, Texas.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Kent Machine Co., Cuyahoga Falls, Ohio.

Knickerbocker Co., Contractor's Manufacturers Div., Jackson, Mich.

Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis.

Kwik-Mix Co., Port Washington, Wis.

Lith-I-Bar Co., Holland, Mich.

Miles Manufacturing Co., Jackson, Mich.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Mixermobile Co. Inc., 608 S. Hill St., Los Angeles, Calif.

Mortarless Machine Corp., 2623 Riverside Dr., Los Angeles, Calif.

Muller Machinery Co. Inc., Metuchen, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Praschak Machine Co., Marshfield, Wis.

Scripps-Pearson Machine Works, P. O. Box 684, Edmonds, Wash.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

T. L. Smith Co., 2885 N. 32nd St., Milwaukee 10, Wis.

Blystone Division, Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.

Stearns Mfg. Co., Adrian, Mich.

Supremix, Inc., Adrian, Mich.

Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

Universal Tampers, Inc., 1530 N. Adams St., Peoria, Ill.

Willard Concrete Machy. Co., Ltd., 2906 Imperial Highway, Lynwood, Calif.

C. M. Wooten Co., 2716 N. Central, Knoxville, Tenn.

Worthington Pump & Machy. Corp., Harrison, N. J.

The Yoder Company, 5500 Walworth Ave., Cleveland 2, Ohio.

MIXERS, CONCRETE (CONTINUOUS)

George C. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kan.

Des Plaines Concrete Prod. Machy., 930 North Ave., Des Plaines, Ill.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Kent Machine Co., Cuyahoga Falls, Ohio.

Lifetime Building Specialties Inc., 519 Brook Haven Dr., Orlando, Fla.

Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

Leslie C. Miller Supply, Inc., Bedford, Ohio.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Penna.

Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.

Superior-Lidgerwood-Mundy Corp., 7 Dey St., New York 7, N. Y.

The Yoder Co., 5500 Walworth Ave., Cleveland 2, Ohio.

MIXERS, MORTAR

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Blystone Div., Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.

Geo. E. Christopher & Son Iron Works, 1220 Blaine, Wichita 1, Kan.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Construction Machy. Co., Glenwood & Vinton, Waterloo, Iowa.

F. C. George Machine Co., 100 S. Westmoreland Dr., Orlando, Fla.

Gilson Bros. Co., Fredonia, Wis.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Kent Machine Co., Cuyahoga Falls, Ohio.

Knickerbocker Co., Contractor's Manufacturers Div., Jackson, Mich.

Kwik-Mix Co., Port Chester, Wis.

Mishco Corp., 615 S.W. 2nd Ave., Miami 36, Florida.

Muller Machinery Co. Inc., Metuchen, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Posey Iron Works, Inc., Brick Machinery Division, Lancaster, Pa.

Worthington Pump & Machy. Corp., Harrison, N. J.

MIXERS, TRUCK

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Concrete Equipment Mfg. Co., 5637 Tweedy Blvd., South Gate, Cal.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Conserco Co., River Rd., & B. & O. R.R., Washington, D. C.

Cook Bros. Equipment Co., 1215 N. Broadway, Los Angeles, Calif.

Imperial Construction Equipt. Co., Melrose Park, Ill.

Jaeger Machine Co., 520 Dublin Ave., Columbus 11, Ohio.

Mixermobile Co. Inc., 608 S. Hill St., Los Angeles, Calif.

T. L. Smith Co., 2885 N. 32nd St., Milwaukee 10, Wis.

Willard Concrete Machy. Co. Ltd., 2906 Imperial Highway, Lynwood, Calif.

Worthington Pump & Machy. Corp., Harrison, N. J.

MIXING PLANTS, CENTRAL

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa.

Butler Bin Co., Waukesha, Wis.

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

Construction Machy. Co., Glenwood & Vinton Sts., Waterloo, Iowa.

The Conveyor Co., Inc., 3260 E. Slauson Ave., Los Angeles 11, Calif.

Dodson Mfg. Co., 1463 Barwise, Wichita 2, Kans.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Mixermobile Co., Inc., 608 S. Hill St., Los Angeles, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Co., 1860 7th St., Oakland 7, Calif.

T. L. Smith Co., 2885 N. 32nd St., Milwaukee 10, Wis.

Stephens-Adamson Mfg. Co., 7 Ridgeway Ave., Aurora, Ill.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Supremix, Inc., Adrian, Mich.

Worthington Pump & Machy. Corp., Harrison & Worthington Aves., Harrison, N. J.

OFFBEARERS

Bergen Machine & Tool Co. Inc., 189 Franklin Ave., Nutley 10, N. J.

Besser Mfg. Co., Alpena, Mich.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

F. C. George Machine Co. Inc., 100 S. Westmoreland Dr., Orlando, Fla.

The Kent Machine Co., Cuyahoga Falls, Ohio.

Lith-I-Bar Co., Holland, Mich.

Mishco Corporation, 615 S. W. 2nd Ave., Miami, Fla.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Smith Machine Sales Co., 505 5th Ave., New York, N. Y.

Stearns Mfg. Co. Inc., Adrian, Mich.

PACKER—HEAD WINGS

Texas Foundries, Lufkin, Texas.

PAINTS AND COATINGS, CONCRETE

American Fluresit Co. Inc., 4011 Red Bank Rd., Cincinnati 27, Ohio.

American Bitumuls Co., 200 Bush St., San Francisco 4, Calif.

Anti-Hydro Waterproofing Co., 265 Badger Ave., Newark 8, N. J.

Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25, Penna.

Carter-Waters Corp., 2440 Pennway, Kansas City, Mo.

Ceresit Waterproofing Corp., 512 S. Canal St., Chicago 7, Ill.

Colorcrete Industries, Inc., 510 Ottawa Ave., Holland, Mich.

W. E. Dunn Mfg. Co., Holland, Mich.

E. I. du Pont De Nemours & Co., Inc., Wilmington, Del.

CLASSIFIED DIRECTORY

A. C. Horn Co., 43-46 10th St., Long Island City 1, N. Y.

Hydrozo Products, Inc., 3230 University Ave., Madison 5, Wis.

Kay-Tite Co., West Orange, N. J.

Masonry Concentrates, Inc., Holland, Mich.

Master Builders Co., 7016 Euclid Ave., Cleveland, Ohio.

Material Chemical & Mfg. Co., 3617 S. May St., Chicago 8, Ill.

Medusa Portland Cement Co., 1000 Midland Bldg., Cleveland 15, Ohio.

Penn Crete Products Co., 20th & Lippincott Sts., Philadelphia 32, Pa.

Reardon Industries Inc., 2837 Stanton Ave., Cincinnati 6, Ohio.

Sakrete Inc., Fischer Ave. & B. & O. R. R., St. Bernard, Cincinnati, Ohio.

Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J.

L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

Stonhard Company, 1306 Spring Grove St., Philadelphia 23, Pa.

Sullivan Company, 212 E. Trigg Ave., Memphis 2, Tenn.

Spray-O-Bond Co., 2225 N. Humboldt Ave., Milwaukee 12, Wis.

Tamms Industries, Inc., 228 N. La Salle St., Chicago 1, Ill.

Tremec Company, 3122 Roanoke Rd., Kansas City 8, Mo.

Truscon Laboratories, Inc., 1640 Caniff Ave., Detroit 11, Calif.

United Paint & Varnish Co., 2128 Niagara St., Buffalo, N. Y.

United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.

Utility Color Co., 377-99 Frelinghuysen Ave., Newark 5, N. J.

PALLETS, STEEL, WOOD, FOR CONCRETE PRODUCTS

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Besser Mfg. Co., Alpena, Mich.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Commercial Shearing & Stamping Co., Youngstown, Ohio.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Fabricators Steel Mfg. Corp., 850 E. 133rd St., New York, N. Y.

Frantz Pattern & Foundry Co., 2201 E. Artesia St., Long Beach 5, Calif.

Fleming Mfg. Co. Inc., 4985 Fyler Ave., St. Louis 9, Mo.

General Engines Co., Inc., 307 Hunter St., Gloucester, N. J.

F. C. George Machine Co., 100 Westmoreland Dr., Orlando, Fla.

Helmick Fdry. Machine Co., 101 8th St., Fairmont, W. Va.

Kent Machine Co., Cuyahoga Falls, Ohio.

Kirk & Blum Mfg. Co., 2807 Spring Grove Ave., Cincinnati 25, Ohio.

Lewis-Shepard Sales Corp., 158 Walnut St., Watertown, Mass.

Lith-I-Bar Co., Holland, Mich.

Market Forge Co., Materials Handling Div., 77 Gravey St., Everett 49, Mass.

Martin Iron Works, P. O. Box 2857, Terminal Annex, Los Angeles, Calif.

Miles Manufacturing Co., Jackson, Mich.

Mishco Corp., 615 S. W. 2nd Ave., Miami 36, Florida.

Mortarless Machine Corp., 2623 Riverside Dr., Los Angeles, Calif.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Pallet Systems Inc., 120 Guardian Bldg., Cleveland 14, Ohio.

Schmeller Aluminum Foundry Co., 2300 E. 87th St., Cleveland 4, Ohio.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 3034, Knoxville, Tenn.

Southeast Steel Sales Co., 100 W. Amelia St., Orlando, Fla.

Stearns Mfg. Co., Adrian, Mich.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

PALLET CLEANERS

Bergen Machine & Tool Co., 189 Franklin Ave., Nutley 10, N. J.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Multiplex Machinery Corp., Elmore, Ohio.

Springfield Pallet Cleaner & Mfg. Co., 501 Southwood Dr., Springfield, Ohio.

PALLET RINGS (UNBREAKABLE)

Texas Foundries, Lufkin, Texas.

PALLET UNLOADER

Hauser Machine Company, P. O. Box 7116, Sylvania Station, Fort Worth, Texas.

PIPE MACHINES

Concrete Forms Corp., 49 Conant St., Irvington, N. Y.

Concrete Equipment Co., 520 Ottawa Ave., Holland, Mich.

Concrete Machinery Co., P. O. Box 2248, Hickory, N. C.

Concrete Pipe Machy. Co., 9th & Division Sts., Sioux City, Iowa.

General Engines Co., 307 Hunter St., Gloucester, N. J.

Houston Concrete Machy. Co., 114 Heights Blvd., Houston, Texas.

Martin Iron Works, P. O. Box 2857, Terminal Annex, Los Angeles, Calif.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Quinn Wire & Iron Works, E. 12th St., Boone, Iowa.

Sherman Concrete Pipe Machinery, Inc., P. O. Box 3034, Knoxville, Tenn.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

Zeidler Concrete Products Machinery Co., Newell & Mobile Sts., Waterloo, Iowa.

PLYWOOD, FOR CONCRETE FORMS

Douglas Fir Plywood Assn., Tacoma 2, Washington.

PROPORTIONING EQUIPMENT

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland, Ohio.

Butler Bin Co., Waukesha, Wis.

Dewey & Almy Chemical Co., Cambridge 40, Mass.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

The Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Howe Scale Co., 3-13 Scale Ave., Rutland, Vt.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Link-Belt Co., 300 W. Pershing Rd., Chicago 9, Illinois.

Madsen Iron Works, 5631 Bickett St., Huntington Park, Calif.

Merrick Scale Mfg. Co., 180-186 Autumn St., Passaic, N. J.

Meyer Scales & Equipment Corp., 445 Central Ave., Orange, N. J.

Noble Co., 1860 7th St., Oakland 7, Calif.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Scientific Concrete Service Corp., 734 Salem Ave., Elizabeth, N. J.

Stephens-Adamson Mfg. Co., 7 Ridgeway Ave., Aurora, Ill.

Stearns Mfg. Co., Inc., Adrian, Mich.

Syntron Co., 450 Lexington Ave., Homer City, Pa.

Toledo Scale Co., Telegraph Rd., Toledo 12, Ohio.

Charles R. Watts & Co., 4121—6th N. W., Seattle 7, Wash.

Winslow Scale Co., 25th & Haythorne Ave., Terre Haute, Ind.

PUMPS, CONCRETE

Chain Belt Co., 1600 Bruce St., Milwaukee, Wis.

Gardner-Denver Co., Quincy, Ill.

Smith Machine Sales Co., 505—5th Ave., New York, N. Y.

Worthington Pump & Machy. Corp., Harrison & Worthington Aves., Harrison, N. J.

RACKS, CURING

Anchor Concrete Machinery Co., 1191 Fairview Ave., Columbus 12, Ohio.

Besser Mfg. Co., Alpena, Mich.

Chase Concrete Machinery, 15 Linwood Ave., Buffalo 2, N. Y.

Chase Fdry. & Mfg. Co., 2300 Parsons Ave., Columbus 7, Ohio.

Columbia Machine Works, 107 South Grand Ave., Vancouver, Wash.

Roy Darden Industries, Inc., Box 95, Northside Sta., Atlanta, Ga.

Equipment Mfg. Inc., 21550 Hoover Rd., Detroit 5, Mich.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Kent Machine Co., Cuyahoga Falls, Ohio.

Kirk Blum Mfg. Co., 2807 Spring Grove Ave., Cincinnati 25, Ohio.

Lewis-Shepard Sales Corp., 158 Walnut St., Watertown, Mass.

Lith-I-Bar Co., Holland, Mich.

CLASSIFIED DIRECTORY

Market Forge Co., Materials Handling Division, 77 Gravey St., Everett 49, Mass.

Moffat Steel Co., 1621 4th St., Bethlehem, Pa.

Multiplex Machinery Corp., Elmore, Ohio.

Gene Olsen Corp., 401 Grace St., Adrian, Mich.

Smith Machine Sales Co., 505—5th Ave., New York, N. Y.

Stearns Mfg. Co., Adrian, Mich.

R. K. Tyra Co., P. O. Forest Lake, Tyra, Minn.

RECORDERS, CONCRETE BATCHING

Conveyor Company, 3260 E. Slauson Ave., Los Angeles 58, Calif.

The Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Howe Scale Co., 3-13 Scale Ave., Rutland, Vt.

C. S. Johnson Co., P. O. Box 71, Champaign, Ill.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Noble Co., 1860 7th St., Oakland 20, Calif.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

Supremix, Inc., Adrian, Mich.

REGULATORS, TEMPERATURE

The Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.

Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.

Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., 444 Wayne Ave., Philadelphia 44, Penna.

The Foxboro Co., Foxboro, Mass.

General Electric Co., 1 River Rd., Schenectady, N. Y.

Groch Engineering Co., Searchlight, Nevada.

O. C. Keckley Co., 400 W. Madison St., Chicago 6, Ill.

Leeds-Northrup Co., 4970 Stenton Ave., Philadelphia 44, Penna.

Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

REINFORCING ACCESSORIES

Adrian Peerless, Inc., 401 Grace St., Adrian, Mich.

Automatic Spring Coiling Co., 4045 W. Thorndale Ave., Chicago 20, Ill.

Cedar Rapids Block Co., Cedar Rapids, Iowa.

Kirk & Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, Ohio.

Star Expansion Prod. Co., Inc., 147-49 Cedar St., New York 8, N. Y.

Symons Clamp & Mfg. Co., 4249 Diversey, Chicago 39, Ill.

Truscon Steel Co., Youngstown 1, Ohio.

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

Wallace Supplies Mfg. Co., 1302-4 Diversey Parkway, Chicago 14, Ill.

Wickwire Spencer Steel Co., 500 5th Ave., New York 18, N. Y.

REINFORCING SYSTEMS, CONCRETE MASONRY WALL

Adrian Peerless, Inc., 401 Grace St., Adrian, Mich.

The Carter-Waters Corp., 2440 Pennway, Kansas City 8, Mo.

Cedar Rapids Block Co., 650—12th Ave. S. W., Cedar Rapids, Iowa.

SAND-LIME-BRICK MACHINERY

Besser Mfg. Co., Alpena, Mich.

Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa.

Jackson & Church, 321 N. Hamilton St., Saginaw, Mich.

Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

W. A. Riddell Corp., Bucyrus, Ohio.

Sturtevant Mill Co., Harrison St., Boston 22, Mass.

Universal Road Machinery Co., Kingston, N. Y.

SANDERS, CAST STONE

Independent Pneumatic Tool Co., 175 N. State St., Chicago 6, Ill.

SAWS, MASONRY

The Black & Decker Mfg. Co., Towson 4, Md.

Champion Mfg. Co., 2028 Washington, St. Louis 3, Mo.

Clipper Mfg. Co., 2801 Warwick, Kansas City, Mo.

Construction Machinery Sales Co., Waterloo, Iowa.

Ever-Ready Bricksaw Co., 1509 S. Michigan Ave., Chicago, Ill.

Independent Pneumatic Tool Co., 175 N. State St., Chicago 6, Ill.

Lee Sales Co., 10439 San Carlos, South Gate, Calif.

Martin Fire Proofing Corp., Buffalo, N. Y.

Stone Machinery, Inc., Box 1363, Syracuse, N. Y.

Supreme Equipment Corp., 12415 Euclid Ave., Cleveland 6, Ohio.

Victor Engineering Corp., 27 Maplewood Ave., Philadelphia 44, Pa.

SCALES, BATCHING

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Penna.

Bonded Scale Co., 2166 E. 3rd St., Columbus, Ohio.

Butler Bin Co., Waukesha, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Erie Steel Const. Co., 67 Geist Rd., Erie, Pa.

Fairbanks Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Howe Scale Co., 3-13 Scale Ave., Rutland, Vt.

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Merrick Scale Mfg. Co., 180-186 Autumn St., Passaic, N. J.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Company, 1860—7th St., Oakland 20, Calif.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

Sintering Machinery Corp., Netcong, N. J.

Supremix, Inc., Adrian, Mich.

Toledo Scale Co., 1020 Telegraph Rd., Toledo 1, Ohio.

Winslow Scale Co., Terre Haute 1, Ind.

Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 15, Penna.

SCALES, HOPPER

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Penna.

Bonded Scale Co., 2166 S. 3rd St., Columbus, Ohio.

Beaumont-Birch Co., 1505 Race St., Philadelphia, Penna.

Butler Bin Co., Waukesha, Wis.

Concrete Transport Mixer Co., 4985 Fyler Ave., St. Louis 9, Mo.

The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif.

Erie Steel Const. Co., 67 Geist Rd., Erie, Penna.

Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

Fanning Schuett Engineering Co., 4325 N. 3rd, Philadelphia, Pa.

Fleming Mfg. Co., Inc., 4985 Fyler Ave., St. Louis 9, Mo.

Hardy Scale Corp., 5701 Atlantic Blvd., Los Angeles, Calif.

Heltzel Steel Form & Iron Co., 1750 Thomas Rd., Warren, Ohio.

Howe Scale Co., 3-13 Scale Ave, Rutland, Vt

C. S. Johnson, P. O. Box 71, Champaign, Ill.

Meyer Scales & Equipment Corp., 449 Central Ave., Orange, N. J.

Multiplex Machinery Corp., Elmore, Ohio.

Noble Co., 1860—7th St., Oakland 7, Calif.

Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth, N. J.

Supremix, Inc., Adrian, Mich.

Toledo Scale Co., 1020 Telegraph Rd., Toledo 1, Ohio.

Winslow Government Standard Scale Wks., 25th & Hawthorne, Terre Haute, Ind.

Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 15, Penna.

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According to Reports from Providence, R. I., Cinder Products Corporation "has begun mass production of building block that float." Royal Sterling, president of the firm, states that the material used in the floating units comes a long way, chronologically and geographically. The pumice that goes into the block was shipped to Providence from volcanic deposits laid down about 3,500 years ago on the island of Santorin, off the coast of Greece. The sea route over which the shipment (20,000 cu. yd.) traveled was estimated at nearly 5,000 miles.

Mr. Sterling explained that importing this material was a last-resort measure in the face of a dwindling supply of cinders in the Providence area. Whereas the local gas works used to furnish from 80 to 90 cu. yd. of cinders per day, the figure has dropped to about 40, and the actual end of the supply is in sight, with natural gas about to be brought in. Units of 8- by 8- by 16-in. size in which the pumice aggregate is used weigh about 14 to 19 lb., depending on the mix, and 4-in. partition units weigh only 8 lb.

Virgil M. Brotton, formerly comptroller of the Universal Concrete Pipe Company at Columbus, O., has been made assistant treasurer of the firm. At the same time it was announced that Edward H. Koglin had been promoted from cost accountant to comptroller.

Major assets of the Spartan Tool & Service Company of Houston, Tex., were recently acquired by the Halliburton Oil Well Cementing Company of Duncan, Okla. The purchase price was reported to have been around $3,000,000, although Spartan would not confirm the figure.

Opening of a concrete block plant in Brownstown, Ind., has been announced by Bob Mann of Seymour. Operating under the name of the Jackson County Concrete Products, the plant will be operated by Ike Haley, also of Seymour.

The Perry Concrete Products Co. of Frankfort, Ind., has been purchased from Wayne Perry by Phil Endres and Elmer Mangis. The latter will have complete charge of the operation of the plant, which will be known as the Clinton County Block Co.

Rhodes & Jamieson, a pioneer ready-mix concrete firm, has completed a new plant and yard in San Lorenzo, Calif., to supply southern Alameda County. The company recently entered into a distributorship agreement with the Worthington Pump and Machinery Corp. for handling trucks and concrete mixers.

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Employees on plan before canvass	81,481
Employees on plan after canvass	329,942
% of participation before canvass	16.8%
% of participation after canvass	67.7%
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**Includes 62,070 employees of six companies which did not have plan before canvass.*

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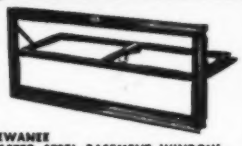

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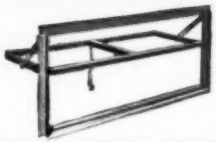

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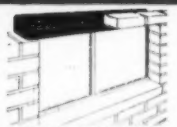

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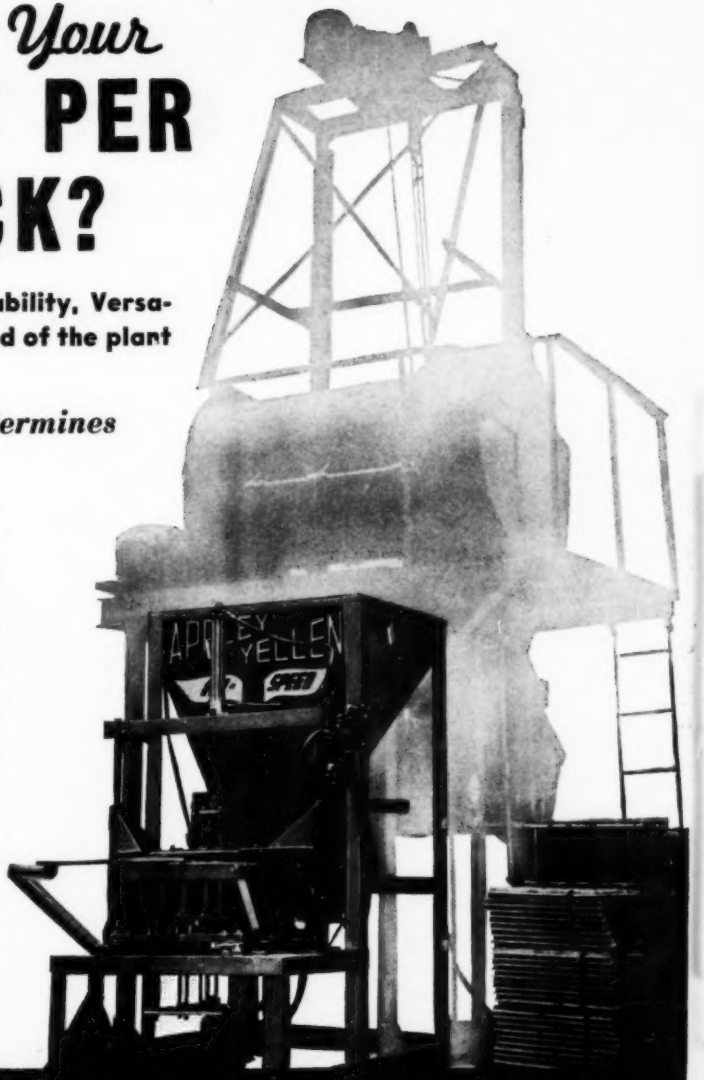

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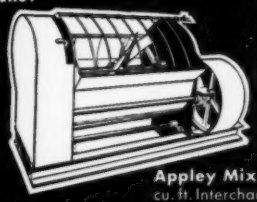

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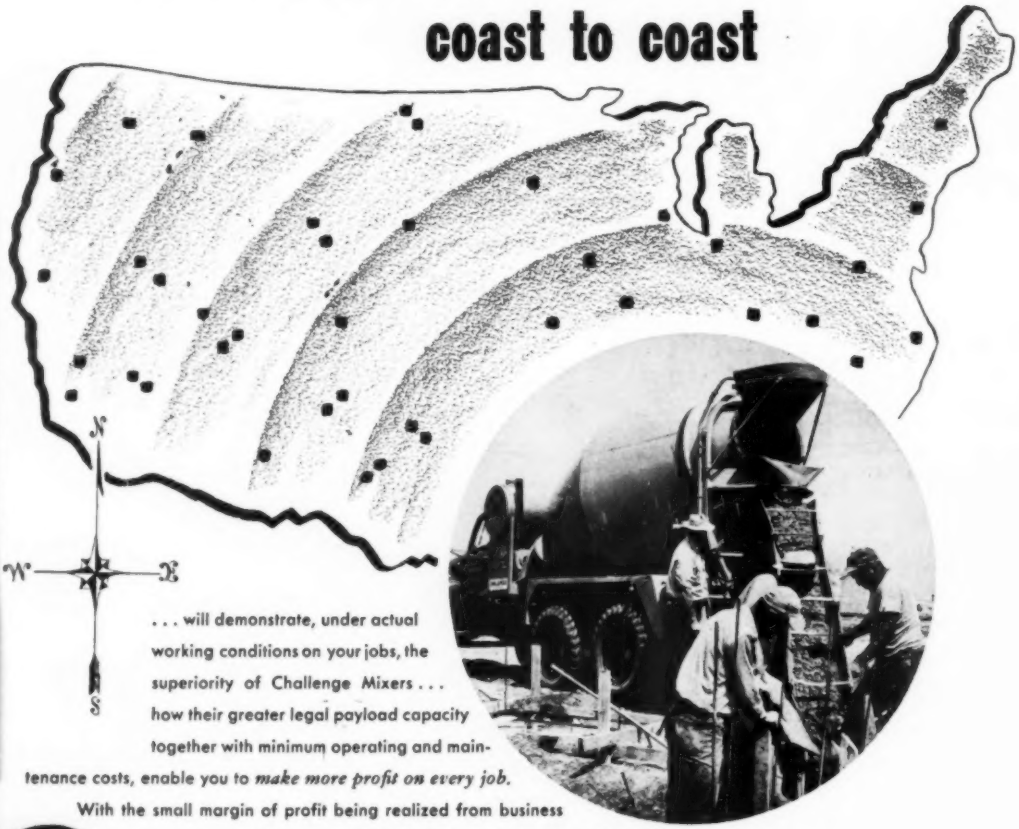

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WISCONSIN — Milwaukee Power Equip. Co., Milwaukee 4

IN CANADA

B. C. Equip. Co., Ltd., Vancouver, B. C.
Contractors Mach'y & Equip. Ltd., Hamilton, Ont.
Duke Equip. Co., Ltd., Montreal, Que.
Frost Mach'y Co., Ltd., Winnipeg, Man.
O.K. Construction & Supply Co., Ltd., Edmonton, Alb.

IN HAWAII

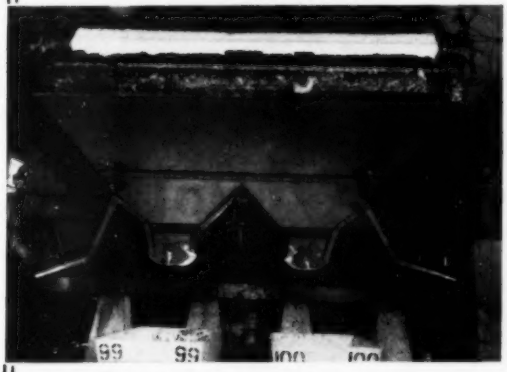
Grace Brothers, Ltd., Honolulu 10

LIME PUTTY is made *Faster... Better... Cheaper...*

MILLER-KOMLINE Process

at the Colonial Blue Diamond Mortar Corporation Plant, Astoria, Long Island, New York.

View showing the drum with its coil spring emerging from the vat, carrying a mat of lime. Note vacuum pipes at end of drum.



Front view showing mat of processed lime leaving the coil springs of filter and dropping into receiving hopper for discharge into boxes for delivery.

The Colonial Blue Diamond Mortar Corporation is using the completely revolutionary, patented M-K process to produce a highly superior slaked lime putty for plasterer's white coat finish, a material that meets top level specifications.

No water or lime is lost—an important feature in this project, as New York water is expensive and sometimes restricted.

Mr. Durando Miller, Vice-President of the Company, states that in his 25 years' experience he has never seen such a high grade putty as they are now making.

TO CONCRETE PRODUCERS:

The M-K method eliminates aging vats, cuts production time to minutes, and yields a uniform putty ready for use when it leaves the machine.

The operation is simple, and works just the same in making lime putty for brick mortar or stucco, and with the use of the ready-mix concrete truck, you are immediately in business to tap this highly profitable business.

Plasterers everywhere say that M-K putty has better plasticity, greater spread, and better covering capacity.

Plants designed by M-K can now be built and put into operation anywhere in the world.

Exclusive patent licenses are now being issued to qualified parties.

Write for Full Details

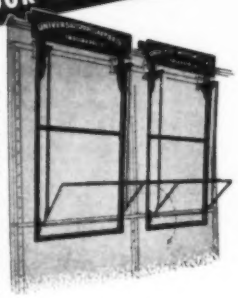
MILLER-KOMLINE CORPORATION

Sole Licensees of M-K Process

Durando Miller — **PEAPACK, NEW JERSEY** — *Thomas R. Komline*

Double Feature FOR CURING-ROOM EFFICIENCY

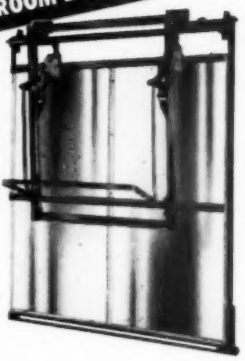
1 UNIVERSAL DOOR CARRIERS



World-famous since 1904, this efficient door handling device is ruggedly built to give years of trouble-free service with practically no maintenance. See it demonstrated and you'll quickly observe how it can improve your operation—by faster, easier door-handling, and by automatically insuring a good tight closure every time.

Send for Latest Literature
Write, Wire or Phone
(Capitol 8677)

2 UNI-TEMP CURING ROOM DOORS



Fully insulated, all-metal construction. Let us show you how they can help you: 1. Reduce costs; 2. Increase operating efficiency; and 3. Improve the quality-uniformity of your product. The investment is moderate. In fact, many block manufacturers have told us they expected a much higher cost—up to four or five times as much!

SINCE 1904
UNIVERSAL DOOR CARRIER, INC
1117 CORNELL AVENUE
INDIANAPOLIS 2, IND.

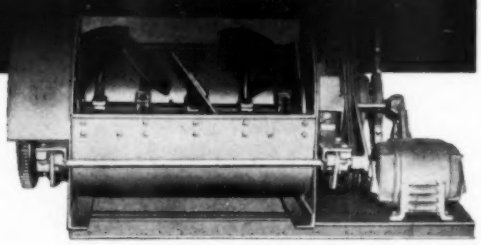
MANUFACTURERS OF QUALITY DOORS AND CARRIERS

MULTI-BLADE MIXERS

Faster—Better—LOWER COST Mixing

"Super Action" blade arrangement gives these "super" results! Unlike the two conventional spiral blades, which push the mix one way along their entire length, Multiplex' ten paddle shaped blades push the mix in opposing directions. This cutting, turning, and kneading produces thorough mixing in shorter time, at less cost. Liner wear is reduced, as the mix is churned against itself.

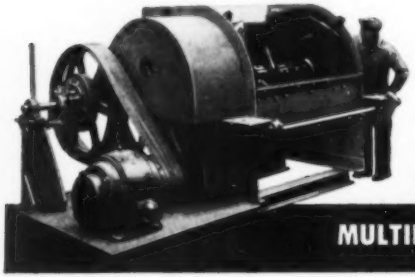
Around these "super action" paddles Multiplex builds a solid, dependable mixer with all the common sense advantages of: convenient charging height, discharge door control in front, anti-friction bearings, and wear-resistant, replaceable liners and blades.

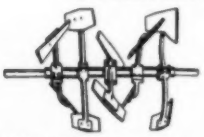


V-belt drive, rear discharge, 18-cubic foot capacity

Many *Multi-Blade Mixers*, in standard sizes from 3 to 60 cubic feet, are in stock for immediate delivery. All models may be had mounted on rubber tired steel trucks. Discharge door may be in the rear, either end, or bottom, or in more than one location, as desired.

Special Mixers are made to suit your special requirements. During our 40 years of successful mixer design and manufacture we have produced mixers as large as 600 cubic foot capacity.





V-belt drive, end and rear discharge, 60-cubic foot capacity

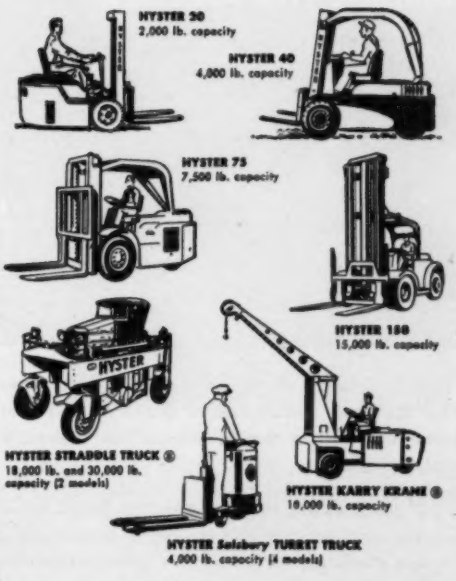
To profitably operate any mixer, it must fit your needs and facilities. Multiplex engineers can help you plan your plant expansion. We can supply the superior mixers, fully automatic block machines, vertical and inclined skip hoists, and the compartment aggregate bins required for successful plant operation.

MULTIPLEX Machinery Corporation • Elmore, Ohio

The World
IS HYSTER'S WORK YARD

The sun never sets on Hyster Sales and Service. In the important industrial centers of the United States and in 58 foreign countries, Hyster dealers maintain service and parts stations on Hyster Fork-type Lift Trucks, Straddle Trucks, Karry Kranes and Hyster *Salsbury* Turret Trucks.

This world-wide organization sells the most complete line of Industrial Trucks and Attachments on the market. Equally important, they have skilled service mechanics and adequate parts stocks to keep your lift trucks running better at lower cost.



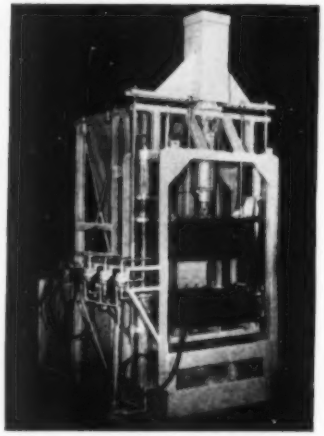
HYSTER® COMPANY

THREE FACTORIES

2926 N. E. Clackamas Street . . Portland 8, Oregon
1826 North Adams Street . . . . . Peoria 1, Illinois
1026 Meyers Street . . . . . Danville, Illinois

Announcing the New and Improved

WEST-O-MATIC BLOCK MACHINE



400 BLOCKS PER HOUR

2 BLOCKS IN **1** OPERATION

SEMI OR FULLY AUTOMATIC

WEST-O-MATIC has ALL the features . . .

"FINGER-TIP CONTROL" pneumatic power operation, virbration and off-bearer . . .

Plain pallets (⅓ usual pallet investment) . . .

Makes all size blocks 16" or 18" lengths, modular sizes or to your special core requirements . . .

Quick easy changeover . . . True dimensional, perfect blocks . . . Compact . . . Easy to install and clean. Ask about our new 3 unit machine.

WESTMONT WELDING & MANUFACTURING COMPANY, INC.

344 Haddon Ave. **Phone COllingswood 5-4769** **Westmont, New Jersey**

Dixon CONCRETE MACHINERY

CONCRETE PIPE MACHINES

The Plant behind the Product...

Quick delivery of precision-made Dixon Concrete Pipe Machines, and *immediate* delivery of all wearing parts, is assured by the facilities in this modern, fully equipped plant.

All machines are thoroughly tested before delivery; wearing parts are precision-machined, gauged and held to close tolerances for quick, easy interchangeability.

Write *today* for complete information on Dixon Model "C" Concrete Pipe Machines and associated equipment.

HOUSTON CONCRETE MACHINERY CO.

Plant: 6600 Washington Ave.

Office and Mailing Address: 116 Heights Blvd.

HOUSTON, TEXAS

Manufacturers of:

Dixon Pipe Machines
Pipe Bend Machines
Dixon Mixers

Dixon CONCRETE MACHINERY

Septic Tank Forms
Dixon Conveyors
Off-Bearing Carts

make your Smith-Mobile fit your needs!

Your Smith-Mobile LOADLIMIT Model can easily be converted to a standard Smith-Mobile Truck Mixer or Agitator. A Standard Model can easily be converted to a LOADLIMIT Model.

Your Smith-Mobile LOADLIMIT models are NOT lightweight, inferior truck mixers built down to a price. They are standard Smith-Mobiles without in any way compromising with high-quality design, rugged construction and mixer performance. Reduced weight is accomplished by eliminating the closing door and other parts not basic or necessary to mixer operation.

Think of the advantage this gives you when it comes to long range planning for the future. Your present investment will remain intact. Smith-Mobiles are designed and built at the factory for quick convertibility. So, if you should change your mind, you can always convert your LOADLIMIT models to standard Smith-Mobiles. The required parts and assemblies can be added in the field — anywhere. Your own mechanics can easily perform the job of bolting the parts into place.

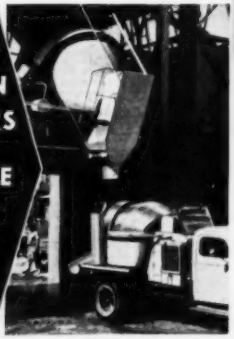
Smith-Mobile LOADLIMIT models give you just what you are looking for...lower weight ...lower initial cost...less maintenance... BIG payloads . . . and greater profits. 4 sizes available. And remember, these sturdy machines carry identically the same factory warranty as standard Smith-Mobiles.

Let your nearby Smith Distributor give you all the LOADLIMIT facts. Ask for literature.

TRY this WINNING COMBINATION

SMITH TILTERS and SMITH-MOBILE AGITATORS

Enables you to deliver quality concrete with speed and certainty, at low cost. Sets up your Ready-Mix plant on a really profitable basis.



THE T. L. SMITH COMPANY, 2887 N. 32nd St., Milwaukee 45, Wis., U. S. A.

SMITH
THE T. L. SMITH CO. MILWAUKEE U.S.A.

CONCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

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Advertising Rate Per Issue: $10.00 a Column Inch. Lower Rates on a Contract Basis — Write for Rate Card.

Unusual Opportunity to own and operate

BESSER VIBRAPAC BLOCK PLANT

One of the best plants—located in a busy section of Eastern Pennsylvania. RR Siding. Large, well established. Second machine No. 9 Joltcrete with pallets. Fully complete with Blaw-Knox Steel four compartment bins, weighbatcher, bulk cement equipment. Nine Kilns with new boiler & oil burner. Lintelator, crusher, two Twinmotors, one Clark lift truck, Scoopmobile. Five motor trucks.

Would cost well over $225,000 to duplicate. Business should be more than $400,000 with excellent profit. Priced to sell — Good reason for selling.

Some cash required and a successful block plant background essential.

Wire or Write:

Box No. 916, c/o Concrete Manufacturer
538 S. Clark Street — Chicago 5, Illinois

PUMICE AGGREGATE

- White Pumice Aggregate graded to any specifications in the Northwest's most modern processing plant.
- Low initial cost plus guarantee weights at 1200#/yd. with fully loaded cars means lower cost for pumice actually received.
- Immediate delivery.
- Sponsor of Pumice Research-Oregon State College.

THE CENTRAL OREGON PUMICE CO.
125 Oregon Ave., Bend, Oregon
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(Write or call for further information.)

FOR SALE

2—4c.y. Rex Mixers mounted on K-11 International.

1—4c.y. Ransome Mixer mounted on K-11 International.

1—Late model 4½ c.y. mixer mounted on L-210 Tandem rear late model International Chassis.

These trucks are for sale as one unit or as separate units.

The above equipment is in excellent condition and is working at present but is subject to immediate release.

BUILDER'S CONCRETE, INC.
North Windham Road — Willimantic, Connecticut
Tel. Willimantic 3-6218
Write: P.O. Box 173, Willimantic, Connecticut

PROMPT - SHIPMENT

Ford Block Machines — 240 blocks per hour

Ford Mixers — can't be beat

Ford Conveyors, Cup or Belt, built to order

Ford Bins & Hoppers — any size. Built to order.

Ford Cement Block Mach. Co.
Cedar Falls, Iowa

PACKER-HEAD WINGS
Both McCracken Type and Martin Trowelers—PROVED to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

WANTED

39" Tongue & Groove Concrete Pipe Forms
54" Tongue & Groove Concrete Pipe Forms
Advise location, price and when can be inspected.

Box No. 914, c/o Concrete Manufacturer
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TWO HYDRAULIC hand lift trucks, 3,500-lb. capacity. Exceptionally good condition. Price $200.00 each. One truck has bed 38 inches long, other one 62 inches long. Other measurements both trucks: In lowered position, 10 inches from floor. Width, beds—26½ inches. Lift, 3 inches. Wheel bases, 39 inches. Write or call John Stoops, R. F. D. 1, New Paris, Ind. Ph. New Paris 312.

FOR SALE

1 Model O.C.A. Multiplex Block Machine, complete for making 16" x 16" — 9½" square Core, solid flue, liner (7)-9 Chimney blocks.

Practically new — $300.00 cash

C. R. CARLSON
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CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb packages

manufactured by
LANDERS-SEGAL COLOR CO.
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FOR SALE

JOLTCRETE BLOCK MACHINE
(Stearns #9)
with complete attachments, and in good operating condition.
PRESSED STEEL PALLETS
for above listed machine
3600—4" ZONAL 500—12" PAMPAS
4000—8" BACCA 100—12" PALM
also: 400—cast iron multiplex chimney block pallets, size 16" square with 9" flue
MOLD BOX ATTACHMENTS
4"—8" & Chimney Block attachment
RACKS—for above listed machine
100—racks of 72 block capacity
3—TURNTABLES—Size 7' x ½"

This equipment may be inspected at our Kings Landing Plant. The Stearns #9 Joltcrete is operating every day. Your inquiries invited.

CRANDALL'S
Concrete Products
P. O. Box 119
Benton Harbor, Michigan

UNBREAKABLE PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

MINERAL COLORS
for
BRICK MORTAR STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

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1 Fontaine "Auto Load" Dump Body for hauling 440 - 8x8x16" Blocks per trip. Price $1,500.00.

ALABAMA CEMENT TILE COMPANY
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FOR SALE:
1—Stearns Clipper Stripper with attachment and pallets for making 1250 7⅝ x 15⅝ blocks. Excellent shape. Now it operating in McPherson, Kansas. Reasonable.
1—Stearns Clipper with 8" and 4" attachments. Excellent shape. Now it operating in Ottumwa, Iowa. Reasonable.
For further information on these or used Joltcretes contact

Phil Oram, 4119 W. 74th Terrace, Mission, Kansas
Ph. Gilmore 9780

FOR SALE

Special—Need the space
The following equipment is in A-1 condition.
(1) 14' C-G Mixer.....$450.00
(1) Barrett Cravens lift truck with rubber tires and roller bearings.....$150.00
(1) Lewis Shepard Jack lift truck with rubber tires and roller bearings.....$150.00
(1) Miles Power Tamper, block machine with 8" plain attachments.....$250.00

Above prices are FOB Indianapolis, Ind.
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FOR SALE

14-24-36 & 50 cu. ft. Mixers.
Rebuilt Model 9 Joltcrete with 8 inch Modular attachment and 8 inch Modular Steel Pallets.

THOMAS W. NOBLE CO., INC.
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YOURS TO SERVE

If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to

Research Dept.
C/O The Concrete Manufacturer
538 S. Clark St. — Chicago 5, Illinois

ADVERTISE YOUR "WANTS" AND SURPLUS EQUIPMENT

CONCRETE MANUFACTURER
538 S. Clark St., Chicago 5, Ill.

FOR SALE

1—Stearns Tamper Block Machine (not the clipper)
10", 12" & 8" mold box and fillers
10", 12" & 8" tamp feet and cores
1—Clark platform lift truck
1—Yale hand lift truck
1—Stearns Block Machine for making specials to be placed under a suspended tamper.
Very good condition—Best offer takes these items.

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Stearns #9 converted to Plain Pallets with 4", 6" and 8" attachments. Offbearer and about 850 — 18½ x 26" x ¼ steel pallets in like-new condition included. Located in central U. S.

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CEMENT BATCHING PLANT

Complete, including aggregate bin, cement bin and batcher and cement elevator.

Write: FRANKLIN LIMESTONE CO.
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FOR SALE

1 Apsley-Yellen Block Machine with 8 & 4" attachments, Bullnose & Sash pallets, Pallet mixer, Skip. Less than one year old. Priced complete at $7000.

Reason for selling—Buying larger machine.

Box No. 918, c/o Concrete Manufacturer
538 So. Clark St. Chicago 5, Ill.

FOR SALE

One 12" mold box for Fleming machine, new.
500—new 12" wood pallets.

ADAMS CONCRETE PRODUCTS
Wittenberg, Wisconsin

PRICED TO SELL

Two Blaw Knox Hi-Boy two yard Concrete Mixers mounted on 1948 F6 Ford trucks. Good appearance and in excellent running condition.

GRAYSON LUMBER COMPANY
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1—Lith-I-Block with 8" x 4" attachments, 1950 model. Also air compressor included.

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Modern Sand Plant. 120 ton hourly capacity. Sand and pea gravel. Average sales $25,000 year. Equipment in A-1 condition. Private spur including block residence. 20 year lease and as long as profitable to produce sand. Price $45,000.

STANDARD SAND PIT
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All shades and grades the highest quality.
Write for color cards, prices and samples

RICKETSON MINERAL COLOR WORKS
MILWAUKEE 2, WISCONSIN
Established 1885

FOR SALE OR TRADE

Pallets—Converting to Magnetic offbearing and will sell 2500 used aluminum alloy pallets at $3.00 each or will swap for steel pallets.

ALABAMA CEMENT TILE COMPANY
P. O. Box 630 Birmingham, Alabama

CINDER CONCRETE PRODUCTS, INC.
208 W. 43rd St.
Kansas City, Mo.

For Sale

Write Wire or Phone

Joltcrete No. 9 block machine with 3 in., 4 in., 6 in., 8 in., 12 in., and brick attachment. Extra machine parts. Steel and malleable iron pallets for all sizes listed above. 125 steel block racks. Electric Transporter lift truck. Erickson lift truck.

For Sale by Owners Changing Business

Complete Block Plant Equipment including 1 Stearns Clipper Stripper Block Machine electric direct drive all power operation. 6", 8", 12" Mold Boxes. More than 5,000 steel pallets including ends, halves, steel sash, and header attachments. 1 Kent Pallet Oiler. Stearns 18 Cubic Foot Mixer and Skip Hoist with attached direct drive V-Belt Motors and remote controls. Two Conveyors and 1 car unloader with direct electric motor drives. Two Hydraulic Lift Trucks, 1 hand power and 1 electric 2-ton capacity with re-charger. 42 Steel Racks and about $500 worth of stand-by parts. Located near Washington D. C. Inspection of plant in operation invited by prospective buyers. Plant can be easily operated by three men. Capacity, 8-hour, run, about 1800 eight-inch blocks. This plant has been overhauled and repainted every year since it started five years ago, and new parts replaced when needed. It is a real bargain, runs like new, and replacement now about $18,000. Our price is $11,142 cash. Possession in about five weeks. No additional charge to dismantle and load. Quick action advised.

Box No. 917, c/o
Concrete Manufacturer
538 South Clark St., Chicago 5, Ill.

FOR SALE

Rebuilt Multiplex Chimney Block Machine. Makes 16x16 block with round flue 10¼ inches in diameter. Machine good as new. Price, $250.00.

JOHN T. STOOPS
RR 1, New Paris, Ind. Ph. New Paris 312

FOR SALE

No. 7 Joltcrete with power carriage and height control for making 4", 6", 8" and 12" 3 core 45°. Also molds for making 8x16x16 flue and liner chimney blocks. 8000 commercial steel pallets for making above sizes. 64 steel racks 42-9" capacity. Kent Pallet Oiler. $5000.00 F.O.B. Carlisle, Pa. This Equipment in A-1 Condition

RALPH E. GIBSON
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1948 Dunbrik plant for sale complete with racks and palletz, for 15,000 bricks per day. Dunstone attachments complete. This machine will pay for itself in six months. $3,000.00.

INDIANAPOLIS DUNBRIK COMPANY
2321 Kentucky Avenue Indianapolis 44, Indiana
Phone: Belmont 4841

SELL SWAP BUY

100,000 Pressed Steel, Aluminum and Cast Iron Pallets.

In Stock Size	Kind	Price
3"	Steel	28c ea.
3"	Steel	32c "
4"	Steel	38c "
4"	Aluminum	38c "
4"	FC George Welded	25c "
6"	Steel	49c "
8"	Steel	52c "
8"	FC George Welded	35c "
8"	Aluminum	52c "
8"	Steel	35c "
10"	Steel	65c "
12"	Steel	85c "
12"	Cast Iron	45c "

BLOCK MACHINES

1—#7 Joltcrete Plant Complete — $6000.00. Consists of #7 Joltcrete Stearns Skip, Kelly Mixer, 2500—8", 3000—4", 1000—12".

1—Stearns Model A Clipper Stripper, Complete, Perfection Condition. $995.00

1—Kelly Tamper $300.00

1—#9 Joltcrete, with Air Off Bearer, Automatic Carriage $3500.00

1—FC George, Hydraulic Block Machine, Mixer & Conveyor, 2700—8" pallets, 1000—4" pallets....$2000.00

2—Gravely Block Machines, less motors. Each $350.00

3—Stearns Clipper 4" Mold Boxes, includes Stripping Fingers and Feet. Each $165.00

8—#7 & #9 Mold Boxes, various sizes. Each $300.00

1—Brick Attachment, #7 Joltcrete and 1500 steel pallets.....$750.00

2—Air Offbearers. Each.....$250.00

CONCRETE MIXERS AND SKIP LOADERS

1—30 cu. ft. Kelly & Stearns 28 ft. Skip $2100.00

1—Continuous Mixer — George C. Christopher $200.00

MISCELLANEOUS

60—Steel Chase Racks, 52 Block Capacity, Each $15.00

10—Steel Racks, 72 Blocks, Hinged Type. Each $15.00

1—Barrett Craven Hydraulic Lift Truck $195.00

WE BUY COMPLETE CONCRETE BLOCK PLANTS

WRITE WIRE PHONE

GENERAL CONCRETE EQUIPMENT CO.
Used Equipment Division
307 Hunter Street, Dept. PQ
Gloucester, New Jersey
Phones: Gloucester 6-1337 and 1338

IVAN is watching you

IVAN is a dyed-in-the-wool Communist. There are only 6 million party members like him in all Russia, yet these Communist brass-hats enforce the iron dictatorship of the Kremlin over *200 million* Russians.

He's sold to the hilt on Red ideas. Which means he's out to get *you*. He believes it's either you or him . . . that the world is too small for both.

Ivan is working hard to beat you down. He has a big head start.

Right now he's got you in a bad spot.

Ivan is afraid of only one thing.

He fears your ability to out-produce him in guns, tanks, planes.

Frankly, he doesn't think you value your free system enough to do it . . . to make willingly the sacrifices he has squeezed out of the Russians.

But he's wrong!

Because you and all of us have set out to build more and better weapons—to do it faster all the time.

We must use every bit of know-how and inventive skill we have to improve our machines and methods—to turn out more and more for every hour we work. Only in this way can we become militarily strong.

But we've got to supply essential civilian needs as well. We can't allow needless shortages to take prices skyrocketing and lower the value of our dollar.

Sure, that means sacrifices for everybody. But doing this double job well is the only sure way to stop Ivan in his tracks—and to save the freedoms which are ours and which he has never known.

FREE . . . this important booklet tells you how our American System Grew Great

How Americans developed better machines, power and skills to build a great nation . . . Why we have been able to produce constantly more per hour . . . How this has given us the world's highest living standard.

How we can meet today's challenge—Why we must expand our productive capacity . . . supply arms and essential civilian needs, too. Read how this dynamic process works in free booklet, "The Miracle of America," endorsed by representatives of management and labor. Send for your free copy today!

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. . . *see the improvement* . . . **$60**

when your vibrapac has

per day EXTRA PROFIT

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You can see the *results* in actual increased earnings as soon as your super vibrapac is given the "booster" treatment of Oswalt Service.

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Our subscribers to Oswalt Service report remarkable results. Here is a typical letter:—

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Unbeatable Combination

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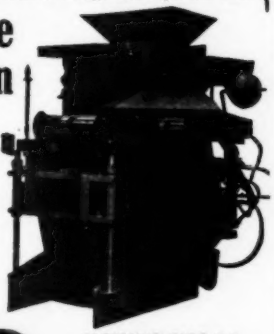

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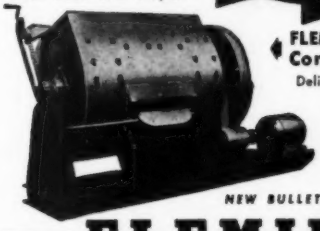
180 block per hour producer. Plain pallet vibrator uses "wood" or steel pallets. Complete range of block sizes and shapes.



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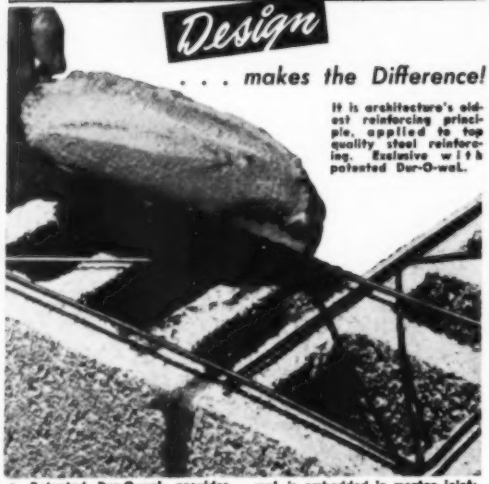

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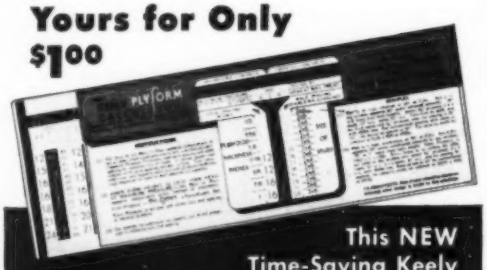

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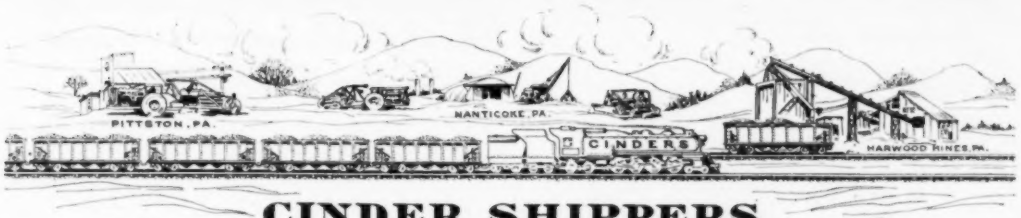

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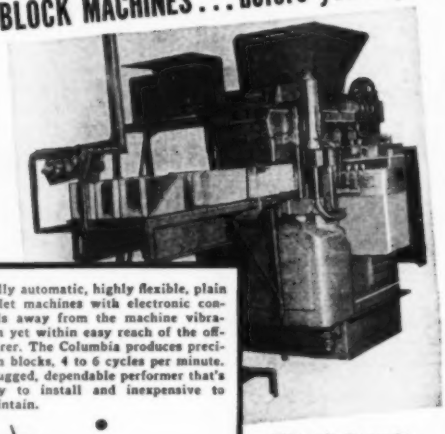

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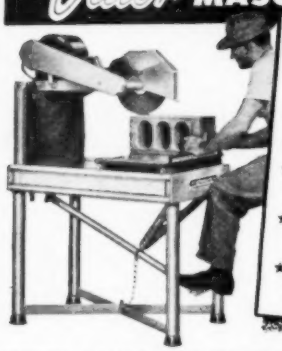

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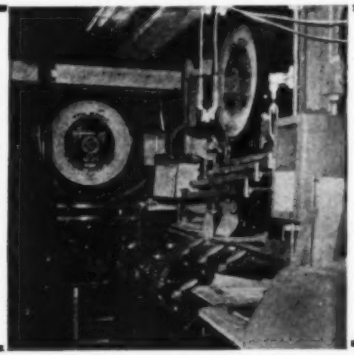

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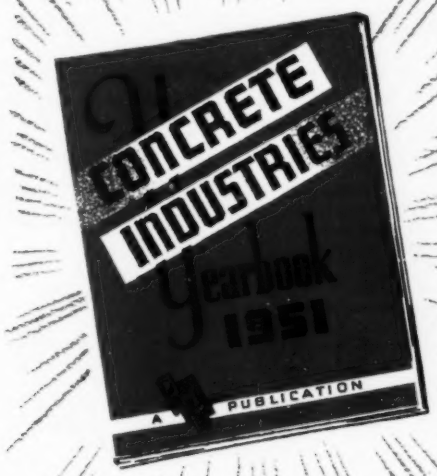

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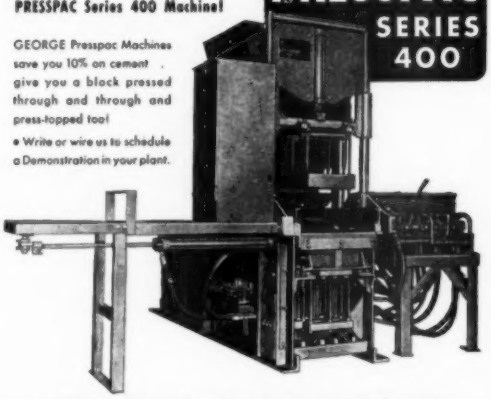

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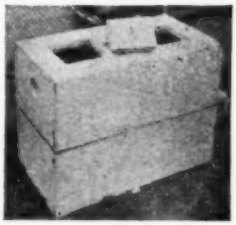

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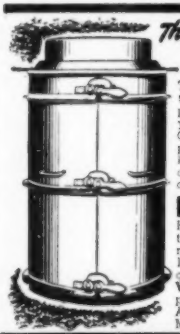

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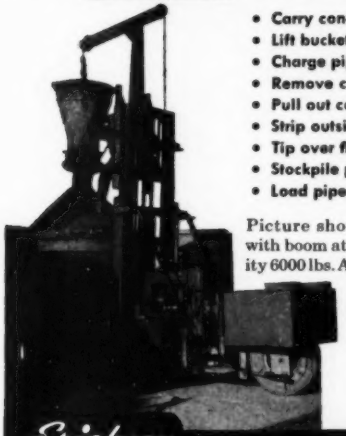

- Carry concrete bucket
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Picture shows Model F-66 with boom attachment, capacity 6000 lbs. Also F-10, capacity 10,000 lbs., and F-16, capacity 16,000 lbs.

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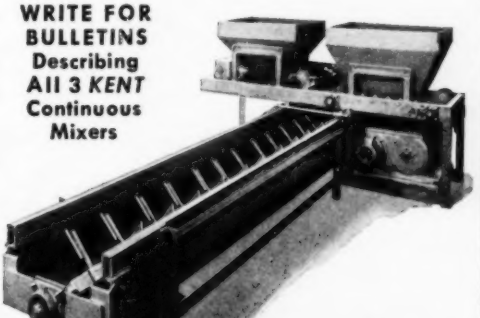

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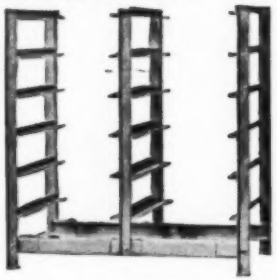

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Another Leader IN THE PRODUCTS INDUSTRY PREFERS BESSER VIBRAPACS!

★ This is the 87th of a series of ads featuring leaders of the Concrete Products industry who are stepping up block production with Besser Vibrapac machines.

Fehr Concrete Products Co. Operates 2 Vibrapac Plants

Fair dealings by Fehr . . . plus continuous high production of quality masonry units by their Vibrapac machines . . . are reasons why the Fehr Concrete Products Company of Eau Claire, Wisconsin has made such remarkable progress.

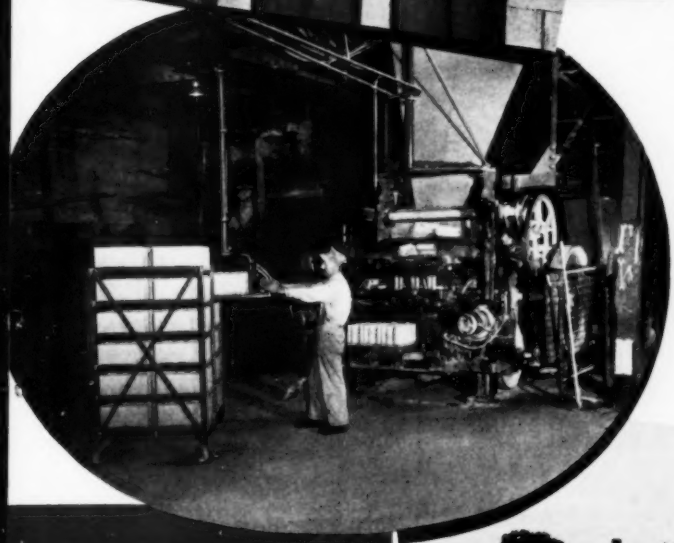
Originally a manufacturer of concrete culverts and sewer pipe, Fehr soon saw the profit possibilities of the Vibrapac machines. Today he produces modular block in all shapes and sizes, including pilaster block, soffit block for floor construction and concrete brick.

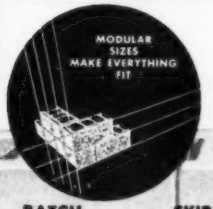
The successful operation of the Super Vibrapac in the Eau Claire plant prompted Fehr to install the second Vibrapac at Rice Lake. Further expansion, with additional Besser equipment, is planned.

BESSER MANUFACTURING CO.

Complete Equipment for Concrete Products Plants

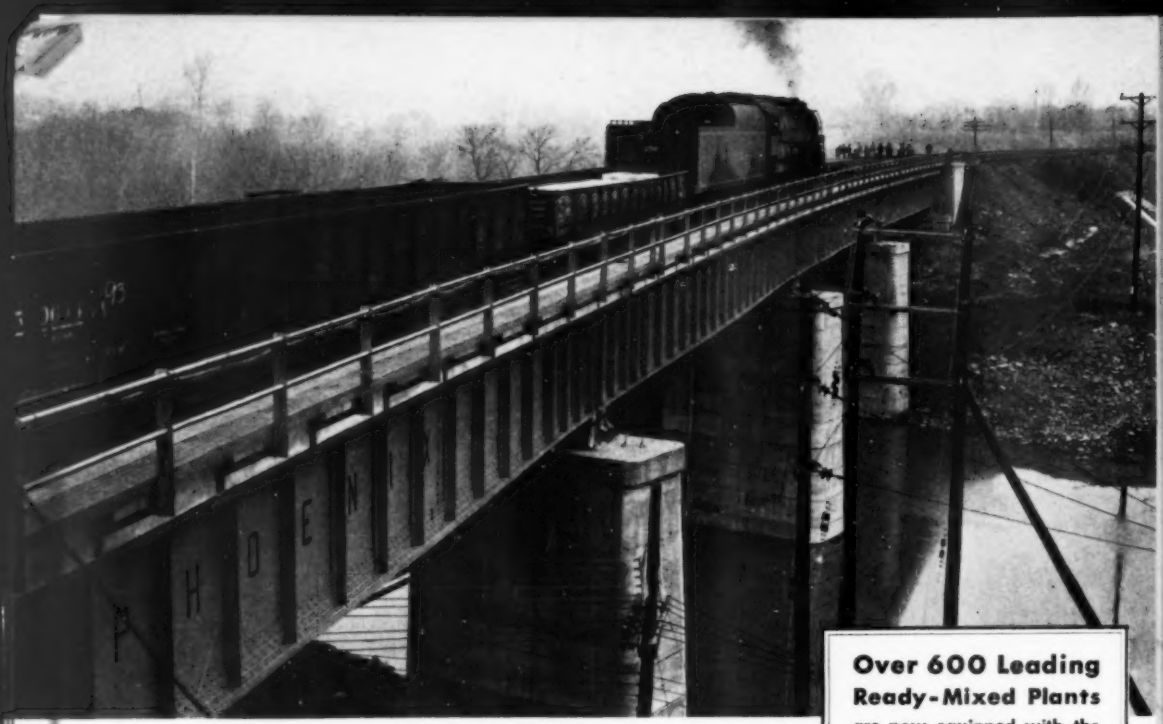
ALPENA, MICHIGAN, U. S. A.





BESSER

BATCH MIXERS | SKIP LOADERS | BLOCK & BRICK CUBERS | SUPER VIBRAPAC | AGLITE PLANTS | ACROW CENTERS | ROOF TILE MACHINE



Reading Railroad Co. Bridge, Glenside, Pa. Engr.—Reading Co.; Contr.—Bates & Rogers, Chicago; Pozzolith Ready-Mixed Concrete supplied by Reading Ready Mix Co.

POZZOLITH BETTER CONCRETE In Reading Railroad Bridge

Better performance *during* construction . . . better performance *after* the job is completed . . . is standard with Pozzolith Concrete and accounts for its wide use in such important structures as this Reading Railroad Co. half million dollar belt line bridge.

CONSTRUCTION advantages of Pozzolith Concrete include — easy placeability, good cohesiveness, reduced bleeding, designed strength, good bond of concrete to steel, reduced shrinkage and minimum finishing.

SERVICE advantages are — good appearance, low permeability, minimum volume change, great durability, and maintenance economy.

POZZOLITH provides these benefits — *at lower cost than by any other means* — because it disperses cement, reduces water and entrains the optimum amount of air. *Full information and literature on request.*

Over 600 Leading Ready-Mixed Plants are now equipped with the POZZOLITH AUTOMATIC DISPENSER

WHY?

Because a producer can, at lower cost:

1. Produce concrete of low permeability . . . with normal Portland cement.
2. Produce high-early strength concrete . . . with normal Portland cement.
3. Produce air entrained concrete without strength loss . . . with normal Portland cement.
4. Produce all of the above properties out of one cement bin . . . with normal Portland cement — stepping up production, reducing inconvenience in handling and cutting costs.

•

In normal mixes, concrete of any given durability, strength and workability, is produced more economically with Pozzolith than by any other means.

Over 600 Leading Ready-Mix Plants
Are Producing Pozzolith Ready-Mixed Concrete

(Names Of Your Nearby Producers Supplied Upon Request)

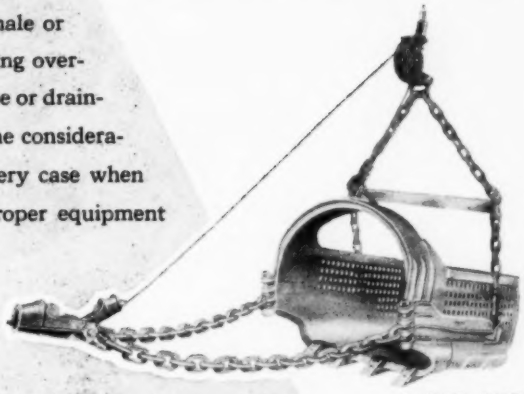
the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

FROM ANY *ANGLE*

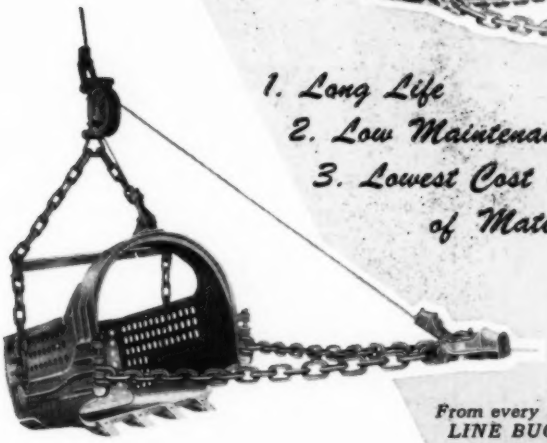
HENDRIX DRAGLINE BUCKETS *are your* BEST BUY

No matter what the digging job ... whether it's moving shale or hard formations, stripping overburden, dredging, levee or drainage work ... the same considerations apply in every case when choosing the proper equipment for the job.



A SIZE AND TYPE FOR EVERY DIGGING PURPOSE

1. Long Life
2. Low Maintenance Cost
3. Lowest Cost Per Yard of Material Moved



3/8 TO 40 CUBIC YARDS

From every angle HENDRIX DRAGLINE BUCKETS meet every one of these important considerations. They are RUGGED ... built for long life, require little upkeep expense and as a result, give you lowest-cost-per-yard service. So, check your digging problems from every angle. You'll find, as others have, that it pays to choose HENDRIX DRAGLINE BUCKETS ... the buckets that offer lowest per yard cost ... for every digging job.

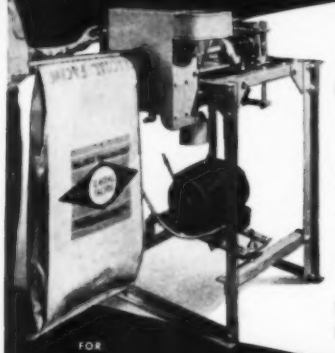
HENDRIX *Lightweight* **DRAGLINE BUCKETS**

HENDRIX BUCKETS WITHOUT PERFORATIONS ON SPECIAL ORDER ONLY

HENDRIX MANUFACTURING CO., INC.

MANSFIELD – LOUISIANA

BLACK DIAMOND AUTOMATIC
CONTROLLED WEIGHT
valve bag packer

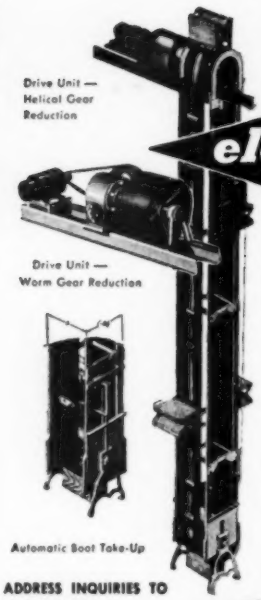


Accurate • Fast
Simple to operate
Push-button control
Material agitating feed hopper
Position of bag on filling tube does not affect final bagged weight
Moderately priced

★ PERFORMANCE GUARANTEED ★

FOR FURTHER INFORMATION WRITE **BLACK PRODUCTS COMPANY** TO 13513 S. CALUMET AVE. • CHICAGO 27, ILL.

MANUFACTURERS SINCE 1912



EHRSAM employees
elevator
. . . saves you money

By speeding up inter-floor communication. *No waiting* — another step passes in a few seconds.

Takes up little space. Installation costs are moderate.

Handy *manual control rope* and an *automatic safety stop* guarantee safe operation.

The EHRSAM employees elevator is made in three belt widths, 12, 14, and 16 inches, and with 3 and 5 H.P. drive units. Special designs available for handling bags and boxes. Write today for more complete information.

ADDRESS INQUIRIES TO DEPARTMENT P

THE J. B. EHRSAM & SONS MFG. CO.

ESTABLISHED 1872 — ENTERPRISE, KANSAS, U.S.A.

U|S

U.S.I. SOUND POWERED
assures dependable communication

BETTER THAN HOLLERING . . . BETTER THAN HAND SIGNALS .

Operators can not go wrong because they hear their orders first hand . . . You never have to fuss or worry about battery failures because these telephones with magneto howlers operate independently of any outside power sources . . . Handsets and Heads also available.

Write Dept. J for latest catalog.

UNITED STATES INSTRUMENT CORPORATION
SUMMIT • • • NEW JERSEY

OVER 15,000 POTENTIAL BUYERS
AT YOUR FINGERTIPS

PROFITABLE P and Q ADVERTISING

LIST YOUR USED EQUIPMENT OFFERINGS REGULARLY
in the
* *BROADCAST SECTION*
of
PIT AND QUARRY
538 South Clark St. Chicago 5, Illinois

The meeting place for buyers and sellers

*Largest Classified Advertising Section Serving the Industry

ALLIS-CHALMERS LARGE MOTORS ... Combine Protection & Accessibility

MAINTENANCE COSTS are dealt a double blow by this new line of Allis-Chalmers squirrel-cage induction motors. First, its protective design features minimize the need for maintenance operations. Then, its planned accessibility cuts the cost of doing the maintenance work.

How Maintenance is Reduced

In these motors, protection begins with drip-proof construction. But it does not end there. Air discharge openings in the stator yoke are given the added protection of removable louvered panels. Air intakes in the rigid cast iron end shields are located so as to prevent injury to the windings by mishandled tools or other objects. Capsule-type bearing housings protect the bearings and oil supply when the windings are being cleaned. The capsules can remain sealed against abrasive dirt throughout the cleaning operation.

How Costs Are Cut

This added protection has been achieved without sacrificing accessibility. One man can perform all routine maintenance operations. To check the air gap he simply removes a few screw-type plugs from the bearing end shields.

For cleaning, he removes the upper halves of the end shields and reaches right inside the motor with his vacuum cleaner or air hose. And there is plenty of room to reach up back of the stator core through the air discharge openings in the sides of the yoke.

Wide Range of Sizes

These modern-design drip-proof (or splash-proof) cage motors are built in sizes from 60 hp at 300 rpm to 2000 hp at 1800 rpm. Ask your Allis-Chalmers representative to show you the details of this exceptional new motor, or write Allis-Chalmers, Milwaukee 1, Wisconsin, for bulletin 05B7542.

A-3409

ALLIS-CHALMERS

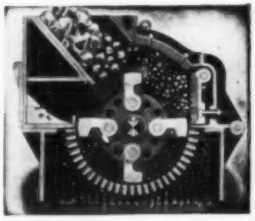
For Cost Reduction on Material Reduction...

WILLIAMS' "HEAVY-DUTY"

HAMMERMILLS

Built to take 6" feed and reduce to agricultural limestone, ¾" stone and other small sizes in *one operation!* Crushing occurs on unusually heavy breaker and grinding plate before reaching grate. This permits grates to be used for sizing only, minimizing wear. The result; more output, more quickly reduced at less operating cost.

Sectional view of Williams "Heavy-Duty" hammermill, with heavy liners and grinding plate for limestone and other hard material. Particular attention is directed to the grinding plate adjustment which assures uniform close contact of hammers and grinding plate at all times. Also note the metal trap which provides an outlet for the escape of tramp iron.



WILLIAMS ALSO MAKES...

Heavy-duty hammermills in smaller sizes for all quarry operations; impact and roller mills for 200 to 325 mesh grinding; drier mills; air separators; vibrating screens; steel bins; complete "packaged" crushing and grinding plants.

WILLIAMS PATENT CRUSHER AND PULVERIZER CO.
802 ST. LOUIS AVE. ST. LOUIS 6, MO.

WC49-9

WILLIAMS
CRUSHERS GRINDERS SHREDDERS

ELLERNAN

CALCINER for burning LIMESTONE MAGNESITE DOLOMITE etc.

4 SIZES AVAILABLE

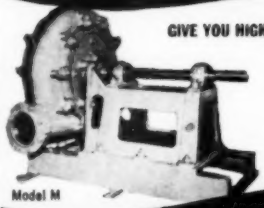
PREHEATS — CALCINES — COOLS
AUTOMATIC CONTINUOUS OPERATION
MINIMUM FUEL CONSUMPTION

There are extra dividends available in the operation of your plant when you use Ellernan Calciners . . . let us explain the exclusive features . . . write today for literature and detailed information applicable to your operation.

THE ELLERNAN CO.
Continental Bank Bldg. Salt Lake City, Utah

Lightning SAND & GRAVEL **PUMPS**

GIVE YOU HIGH CAPACITY AT LOWEST COST...



Model M

Lightning Semi-Heavy pumps deliver against 90-ft. heads, pump 9 yds. an hour from 3-in. size. Also 4, 6, 8-in. sizes. Lightnings have the lowest first, replacement and operating costs of any pump built. Write for information.

FREE BOOK

KANSAS CITY HAY PRESS CO.
801 Woodswether Road Kansas City 6, Missouri

Bucket Ladder Dredges *for* Sand—Gravel

Screen Plates — Bucket Pins

Sand Pumps — Yuba Jigs

YUBA DREDGES — PROVED DEPENDABILITY

YUBA MANUFACTURING CO.
Room 718, , 351 California St., San Francisco 4, California, U. S. A.
AGENTS { BIMS, DARBY & CO., LTD. • SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.
CABLES: YUBAMAN, SAN FRANCISCO • SHAWDARBCO, LONDON

BROADCAST and P&Q SECTION

Royal E. Burnham
Attorney at Law

Patent and Trade-Mark Causes

3201 Tennyson Street, N. W.
WASHINGTON 15, D. C.

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. Lee Heidenreich, Jr.
Consulting Engineer
75 Second St., Newburgh, N. Y.
Phone 1828

Operation
Plant Layout
Design
Construction
Appraisals

CORE DRILLING ANYWHERE
We look into the earth
PENNSYLVANIA DRILLING COMPANY
PITTSBURGH 20, PA.

SALES OPENING

Sales engineer for conveying and weighing equipment, also compressors, in Tri-State area. Location Pittsburgh. Small company. Excellent opportunity.

Box No. 904, c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

Diamond Core Drilling
CONTRACTORS
Fireclays, coal, limestone, gravel deposits, all minerals. Blast hole drilling.

MOTT CORE DRILLING CO.
Huntington, West Virginia

WANTED

Young man as Assistant Superintendent for Stone Quarry and Crushing Plant. Some experience necessary. If satisfactory, to become Plant Superintendent within three months after date of employment. Location northern Virginia. State Salary expected. Apply:

Box No. 908, c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

AVAILABLE

Manager-Superintendent — 25 years Experience Open Pit, Tunnel & Dredge Mining of Non Metallic Minerals.
Washing, Crushing, Filtering, Drying & Fine Grinding Limestone, Sand & Gravel, Cement, Feldspars, Phosphate & Clays.
Operation, Maintenance & Sales.
Salary $6500 or percentage Basis.

Address Box 816 c/o Pit & Quarry
538 S. Clark St. Chicago 5, Ill.

SUPERINTENDENT FOR CRUSHING PLANT

Experienced, capable man to operate a large slag crushing plant, capacity 3,000 tons daily. Prefer man with at least ten years experience to be in full charge. Salary commensurate with ability and results in operating this plant which is a new installation. In reply, please give complete history as to age, health, education, background and experience.

Box No. 814, c/o Pit and Quarry Publications
538 South Clark St. Chicago 5, Ill.

WANTED

Master mechanic familiar with stone quarry equipment. Steady work. State age, give references and when available in first letter. Located in central Pennsylvania.

Box No. 913 c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

POSITION VACANT

Young man with several years experience in the manufacturing end of the cement business is needed by a company having a wet process plant for opening as assistant superintendent. Submit full details concerning age, experience, and qualifications. Our Organization knows of this ad.

Box No. 911, c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

POSITION WANTED

Cement Plant Superintendent or Assistant, college graduate 15 yrs. experience, cement plant and construction work—Now Plant Supt. Desire change.

Box No. 915, c/o Pit and Quarry
538 South Clark St. Chicago 5, Ill.

WANTED

Master Mechanic for non ferrous metals plant in southwestern New England. Ten years experience in heavy industry required. Must be U.S. citizen. Replies which will be held in strict confidence, should state age, experience, salary expected, and when available.

Box No. 910, c/o Pit and Quarry Publications
538 South Clark Street
Chicago 5, Illinois

WANTED

Lime Plant Supervisor: Experienced in lime, cement or allied industry. Capable of taking charge of production and maintenance. Citizenship required. Location 70 miles north of New York City. Replies, which will be held in strict confidence should state age, experience, salary expected and when available.

Box No. 909, c/o Pit and Quarry Publications
538 South Clark Street
Chicago 5, Illinois

WANTED

Quarry superintendent, must take full charge, organize own men, experienced in drilling and shooting and setting up plants. Furnish references, age, salary expected and when available in first letter. Located in central Pennsylvania.

Box No. 912 c/o Pit and Quarry Publications
538 South Clark Street Chicago 5, Illinois

WANTED TO BUY

Second hand boom for 50B Bucyrus-Erie Electric Shovel

GREYSTONE GRANITE QUARRIES, INC.
Box 171 Henderson, N. C.

WANTED

1—315 TO 350 cubic feet stationary electric driven Air Compressor, direct connected to motor—220 volt—3 phase 60 cycles with starting equipment and mounted on skids.

MAHONEY-CLARKE, INC.
217 Pearl Street, New York 38, N. Y.

FOR SALE

One: 1¼ yard P & H shovel, Model 600, good running condition. $4500.00.

Box No. 906, c/o Pit and Quarry Publications
538 South Clark St. Chicago 5, Illinois

FOR SALE

Two complete lime plants, now in operation, including balance of 1951 contracts. Deposits unlimited. Quick acting required. Write or see:

WM. S. BRANTINGHAM
820 N. Oak Ponca City, Oklahoma

FOR SALE

Gravel plant at Xenia, Ohio, Greene County. Processes seven grades of material. Over 400 tons of material a day. 3 man operation.

BOX NO. 903, c/o Pit and Quarry Publications
538 South Clark Street, Chicago 5, Illinois

EQUIPMENT WANTED
NEW OR USED

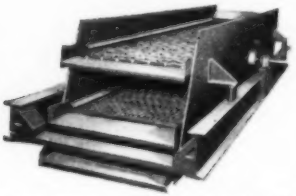
Bucket Elevator, approximately 60' center to center chain sprockets, with 14" x 8" type 80 buckets at 18" center on single strand chain.
Heavy Duty Pan or Apron Conveyor, approximately 14' to 16' long, and 24" wide.
Track Hopper, approximately 8' x 8', for use with above Pan or Apron Conveyor.
Reply to: **Mr. R. B. De Lisle**
General Purchasing Agent
Pittsburgh Metallurgical Co., Inc.
P. O. Box 636
Niagara Falls, N. Y.

SCALES—CRUSHERS—VIBRATING SCREENS
CONVEYORS — FEEDERS — IDLERS
GUARANTEED EQUIPMENT — IMMEDIATE SHIPMENT

CINDER, PUMICE, PERLITE CRUSHERS

10 to 20 tons per hour capacity....$ 479.00
25 to 50 tons per hour capacity.... 1144.00
Complete with hopper.

VIBRATING SCREENS



Heavy duty eccentric shaft types. One to five decks. Screening sizes from 3'x8' to 5'x14'. Priced from.....$1573.00

CONVEYORS — PICKING TABLES

Troughing idler conveyors—picking tables. Any length, belt widths to 60". Prices from $450.00

Flat belt type bulk material conveyors. Any length, belt widths to 48". Prices from $726.00

Build your own conveyors; we have standard sections, head and tail pulleys, take-ups, drives, idlers, speed reducers, sheaves, belting etc.

TRUCK SCALES

15 Ton Truck Scales.....$545.00
20 Ton Truck Scales..... 617.00
26 Ton Truck Scales..... 684.00

Others to 50 ton capacity. All scales complete with structural steel weighbridge, Parts and weighing beams for most makes of motor truck scales.

More than 3000 mines and quarries have modernized with Bonded equipment.

BONDED SCALE AND MACHINE COMPANY
PHONES: GArfield 2186; FRanklin 6-8898, Evenings.
110 Bellview Columbus 7, Ohio

USED EQUIPMENT FOR SALE

2—Shovel Fronts for ¾ Yd. Bucyrus-Erie Type B Steam Shovels. Booms, Sticks & Dippers. Condition: Excellent. Price: $500.00 each.

1—Electric Converter, Model FCE8 Reliance. 1½ H.P.—8 KVA—440 V. —60 Cy.—3 Phase. Condition: Good. Price $350.00.

1—Roll Crusher, Martin 18" Style F. Condition: Good. Price: $400.00.

2—Well Drills, Loomis Model 44 Clipper Full Crawler Blast Hole. Gasoline Powered. Condition: Excellent. Price: $4,500.00 each.

1—Scale, Exact Weight Style #2225, 10# Tare Beam, Dial 25#. Under 5# Over with Dustite Bagholder. Condition: Good. Price: $200.00.

THOMASVILLE STONE AND LIME COMPANY
THOMASVILLE, PA.

NEW & USED EQUIPMENT BARGAINS

New International UD-6 Power Unit Complete.
New International UD-24 Power Unit, complete with sub-base, outboard bearing and electric starter.
New Model HBJ Buda Earth Drill mounted on skids, digs 12 foot depth up to 42 inch diameter.
Rebuilt Case Tractor, Model VIA, equipped with front end hydraulic profit loader and rear mounted hydraulic scraper.
Rebuilt Case Tractor, Model DI, equipped with Hough Hydraulic front end loader ⅝ cu. yd. bucket.
Used Blaw Knox 1½ yd. Clamshell rehandling bucket. Model 716H. Used very little.
Used International U-14 gas power unit, complete with clutch and stub shaft. Good condition.
Used 1000-gallon Rosco Asphalt Distributor mounted on Studebaker 6 x 6 truck.
All Units On Our Floor For Your Inspection.

ROAD BUILDERS EQUIPMENT COMPANY
285 East Calhoun
MEMPHIS, TENNESSEE

FOR SALE

LOCOMOTIVES

1—Plymouth 6 Ton, Gas, 36" Ga. Almost New.
3—Whitcomb 15 Ton Diesel—36" Ga.
2—Whitcomb 15 Ton Gas, Std. Ga.
1—Brookville 10 Ton Diesel, 36" Ga. Like New.
1—G. E. 35 Ton Gas, Eectric—Std. Ga.
1—Porter 35 Ton Gas, Electric—Std. Ga.
Plymouth 70 Ton Propane—Electric.

DERRICKS

2—American 10 Ton 8IL, 70' Booms.

CARS

26—Hopper cars, 15 Ton, 36" Ga. Excellent.
2—Hopper Cars, 50 Ton, 2 Pocket, Std. Ga. Like New.

MISCELLANEOUS

1—Bucyrus 170B Shovel, 5 Yd., 3/60/2300/410n.
Wellman—S-M—Mine Hoist—13000# @ 437 F.P.M. —230 V. D.C.
1—Flory D. D. Elec. Slope Hoist—150 HP
1—A.C. 600 KW Diesel Generator, 2300/3/60.
2—Conway 75 Muckers. #256 & 305.
Burro #10 Track Laying Crane.

R. H. BOYER
2005-13 W. Bellevue Street, Philadelphia 40, Pa.
Phone—SA-2-7132

THE BEST IS CHEAPER!

Diesel Engines

1 - 500 HP, GM, 8-268A
10 - 300 HP, GM, 671 Twins
1 - 60 HP, M&M, HUA Natural Gas
20 - 60 HP with clutch, M&M, Gasoline, New
10 to 30 HP New Nordberg with clutch o. pumps

Diesel and Gas Generators

New, 5KW, Hercules, 110/60 1 phase
New, 10 KW, Onan, 110/220, 1 phase
New, 15 KW, O'Keefe & Merritt, 127/220, 1 phase
Like new, 40 KW, EMC-Nat. Gas, 127/220 3 phase
New, 8/9/12/20 KW, New Nordbergs
New, 30 KW, UD-14 with Century, 127/220, 3 phase

Generators

New, 60 KW, GM, 127/220/60, 3 phase
6 - Like New, 75 KW, Caterpillar, 110/220, 1 phase
New, 110 KW, Murphy, 127/220/440, 3 phase
Like New, 150 KW, Buda, 440, 3 phase
Like New, 187 KW, GM, 440, 3 phase
Like New, 300 KW, GM, 230 Volt D.C.

Get our List!!

Midwest Utilities Power Equipment Corp.
1270 Augusta Blvd., Chicago 22, Illinois
ALL PHONES EVergiade 4-4511

SPECIAL OFFERING

1—new 18 x 32 solid steel frame style D crusher.

1—new 14 x 26 solid steel frame jaw crusher.

1—#6 McCully crusher in good running condition just taken from service.

2—6' dia. 12 x 16' long scalping screens 2¼" manganese perforations.

A number of new manganese steel screen sections for Allis Chalmers 6' revolving screens 2¼" perforations.

New and rebuilt jaw crushers in all sizes from 6 x 10 to 42 x 60.

ACME ROAD MACHINERY COMPANY — Frankfort, New York

FOR SALE

9 — 20 cu. yd. Sterling End Dump Trucks (Rock Bodies) powered by HB6 Cummins Diesel Engines. Ready to work. $5,000.00 each!

GUY F. ATKINSON COMPANY
10 W. Orange Ave.
So. San Francisco, Calif.
Phone — JUniper 4-8120

L.B.SMITH INC.
OFFERS

AIR COMPRESSORS

Ingersoll-Rand 105 cubic foot on 2 pneumatics. Good condition.

Schramm 105 cu. ft. gas powered compressor on 4 steel wheels.

Gardner-Denver two-stage 160 ft.. skid mounted

Worthington 210 cubic foot, two-stage air cooled, on skid base with Hercules diesel.

Pennsylvania 12" x 10" class 3A single cylinder. 355 cubic foot P.D.. flat belt driven. 50 HP slip ring motor.

Worthington two-stage, water cooled, vertical 250 ☆. 60 CFM. new condition.

BELT CONVEYORS & BELT

New 18" — 24" — 30" — 36"

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Universal truck crane.

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1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

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60 ton 2 compartment storage bin with clam shell gates.

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Barber-Greene 44C Trenching Machine.
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½-yd. to 5-yd. dragline buckets.
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2½-ton GMC. New and rebuilt.
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628 Ft. Worthington 15&9½x12 Belted.
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DIESEL: 105, 315, 420, 600, 603, 607 & 1600 Ft.

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9—Elec. Shovels, 17, 10, 8, 4, 2 & 1 Yd.
4—Walker Draglines, 3-6-9-16 Yd.
5—25 & 40 Ton 120 Ft. Boom Whirleys.
7—Loco. Cranes 20, 25, 30 & 40 Ton Diesel & Steam.
8—Diesel Shovels & Cranes 1 to 5 Yd.

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46—KOPPEL, 1½ Yd., 24 & 30 & 36 & 42 In. Ga., V Shaped.
115—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
60—Std. Ga. 12 Yd., 18 Yd., 20 Yd. & 30 Yd. & 50 Yd. Cap.

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5'x22", 6'x22", 6'x48", 8'x22" & 8'x36" Hardings Conical Ball Mills.
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Nos. 1, 1½ & 2 Sturtevant Ring Roll.
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Loomis 44, Keystone 51 & 71
10—IR—FM3—Wagon Drills

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Blake Type—9x15, 10x20, 12x24, 13x24, 13x30, 18x30, 18x36, 24x36, 30x42, 40x42, 60x42, 84x60, 42x48 & 28x36
Single Shaft Type—9x15, 10x15, 11x18, 9x36, 10x30, 15x24, 12x30, 10x36, 15x36, 18x36, 20x36, 24x36, 30x40, 30x42
Cam & Roller Type—8x10, 6x20, 10x16, 10x20, 10x26, 11x18, 12x18, 12x22, 13x21, 12x36, 11x24, 11x36, 13x24, 14x26, 14x28, 15x36, 18x32, 9x40, 24x40, 22x50

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Allis Chalmers 322S Newhouse 5", 7" & 10"
Symons 2', 3', 4' Std. 5½' Short Head Tels. Gyro
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Kennedy 19-S, 25-S, 37-S, 49-S

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Traylor Bulldog 12", 14", 16", 20", Tels. 10B, 13B

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GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
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15—8000, 10000 and 20000 gal. cap. with coils.

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10—Side Dump covered, 70 ton Hopper Cars.

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STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 3 Ton, 8 Ton, 17 Ton & 40 Ton.

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Double Shell: 48"x20', 66"x70'.
Direct Heat: 4'x20', 4'x40', 4½'x40', 5'x24', 5'x30', 5'x50', 6'x35', 6'x50', 8'x50' & 60"x80'
Kilns: 4'x45', 6'x60', 6'x86' & 9'x170'

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6600 Ft. 36, 42, 48 & 60 In. Wide

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VIBRATING: 3x6, 3x8, 3x5, 4x5, 4x8, 4x10, 4x13.
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2—50 KW superior 3/60/220 V.
3—74 KW Caterpillar 3/60/220/440 V.
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3 Phase, 60 Cycle, 220 or 440 Volts (*2200 volts or higher)

H.P.	MAKE	TYPE	SPEED
1000	*G.E.	K6347S	1800
750	*G.E.	KT	720
500	*G.E.	PBG	1800
500	*Fr.-Morse	MS	1200
400	*Cont (new)	NZ	1800
400	*Al-Ch	ARWW	900
300	*Westgh	CS	3600
300	G.E.	FT-559	1800
300	Al-Ch	AR	900
250	L-Allis	146S	720
250	Westgh	CS	600
150	G.E.	IE	1800
150	*Al-Ch	AW	1800
125	Westg (new)	CS504	3600
125	G.E. TEFC	K6326B	1200
120	G.E. (new)	K6333	900
100	*G.E.	FT542Z	1800
100	U.S. (Vert)	CFU	1200
100	Westgh	CS	1200
100	G.E. (new)	K6333	720
75	Westgh	CS761	1800
75	G.E.	K505	1200
75	G.E.	K6333	720
75	*G.E.	IK	720
60	G.E. (new)	K444S	1800
60	G.E. (new)	K504U	1200
60	Al-Ch	AR826F	514
50	U.S. (vert)	SCW	1800
50	Westgh	CS574	1200

Hundreds of Smaller Motors!

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Crane and Hoist Type M3 60/220 or 440 Volt

H.P.	MAKE	TYPE	SPEED
75	Westgh.	C1756A	600
37	G.E.	HITC (TENV)	600
25	Westgh.	C1572	900
22	G.E.	ITC5009	1200
20	Westgh.	C1	900
15	G.E.	ITC5010-25 cy.	720
11	Westgh.	C1464	900
6½	R & M	425A (TENV)	1200
3	G.E.	MTC5160	1200

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312 KVA Crocker-Wheeler AC Generator 3/60/240/480 volt, d.c. to 375 HP Worthington-Moore Turbine, Single Auotmatic, Non-Condensing, 425 PSI, 10 lbs. Exh. 100° F SH with Reduction Gear and Accessories

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KVA	Make	TYPE	P.F.	Spd.
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1000	*Westgh.	803D	.8	900
250	Al-Ch (New)		.8	720
150	El. Machy.	EM	.8	720
112.5	*G.E.	ATD	.8	1200
110	Cr-Wh	103	.8	900

BALANCING SETS

34 KW 250 V. 270 A. Neut. Bogus. Type MCI. 125 v. Gen. BB. Comp'd. on Fabricated Steel Base, d/c
20 KW. 250 V. 160 A. Neut. Crocker-Wheeler. Type 151, 125 V. Gen. 3 sl. bearings, close-coupled.

AIR COMPRESSORS

SIZE	MAKE	TYPE	DISPL.	PSI.
10 x10	Ing-R.	ERI	223	120
10 x8	Ing-R.	DRI	179	85
9 x8	Worth.	HB	211	100
9 x8	Ing-R.	ERI	145	100
8½x8	Worth.	HB	170	100
7 x7	Wroth.	HB	122	100

AC SYNCHRONOUS MOTORS

3 Phase, 60 Cycle, 220 or 440 Volts (*2200 Volts or Higher)

H.P.	MAKE	Type	P.F.	Speed
800	G.E.	TS884	1.0	1800
750	*Westgh.		.8	900
700	G.E.	TS		514
320	*A.C.	Dr Pf	1.0	720
300	Cr-Wh.	ENG	1.0	300
250	*A.C.	Dr Pf	.8	720
220	G.E.	ATI	1.0	600
190	El. Machy.	Ped	1.0	450
150	El. Machy.	EM	.8	720
150	*Westgh.		1.0	300
125	*El. Machy.	SYN	1.0	900
125	Cr-Wh.	103S	1.0	900
125	*G.E.	TS	1.0	277
115	El. Machy.	EM	1.0	240
100	Cr-Wh.	130S	.8	900

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Analysis

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20"	5	1/8"	1/32"
24"	4	1/8"	1/32"
24"	5	1/8"	1/32"
28"	5	1/8"	1/32"
30"	5	1/8"	1/16"
30"	6	1/8"	1/16"

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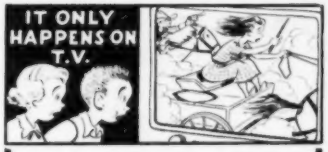

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4—Mdl. 100-2D, 2/drum American Hoists, power 109 HP Waukesha gas engine Mdl. 145-GKU. $5,500 each.

ABOVE HOISTS LIKE NEW—VERY LATE MODEL.

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1—315 CFM Ing. Rand Mdl. 370-A-100, power 4 cyl. Mdl. 4-115-LA Waukesha gas engine, 4 steel wheels. Good condition. $2,500.

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1—30 ton Model F Ohio Steam Crane, 50' boom. Code boiler, excellent condition. Price on request, rebuilt or "as is".

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1—12"x20" Acme Crusher Style A, wt. 9800#. Special price "as is" $375.00.

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1—Lima 2 yd. 26' boom, 18' stick Esco bucket with teeth removed from 801 #512. $2,500.00.

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Farrel-Bacon jaw crusher 15" x 36" with 50 h.p. Westinghouse motor with controls—Feeder—24"—120' conveyor with new belt powered by 10 h.p. G.E. motor and speed reducer. Pioneer shaker screen 4' x 12' with 15 h.p. G.E. motor—4 bins—60,000 lb. Fairbanks scale. To be sold as one unit. Erected new in 1947 Crushing capacity of 80 to 100 tons per hour.

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24 x 18 A JEFFREY HAMMER MILL.

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KUNTZ 5 x 20 CONTINUOUS HYDRATOR.

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GANTRY & O.E.T. CRANES

10 TON P & H—80' SPAN.
3—5 TON NILES SHEP. 32'8" SPAN.
45 TON CLYDE 85' BOOM, GANTRY.
50 TON AMER. 126' BOOM GANTRY.

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RD-7 with bull-dozer
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DRYER OR KILN: Allis Chalmers 10 ft. x 90 ft., heavy duty, plate thickness 22.95 lbs. per sq. ft., complete and with or without coal fired Furnace, Western Precipitation Dust Collector, Clarage #41 Exhauster, Motors, Control equipment, etc. 1—90' x 60 ft., single shell, new condition.
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COMPRESSOR: Worthington 2 stage, 29/18-½ x 21, 600 H.P. synchonous motor, 3 phase, 60 cycle, 440 volt, 180 RPM, cap. 2000 CFM, 100 lbs. pressure, complete with auxiliary equipment. In operation now, available immediately.

LOG WASHER: 25 ft., heavy duty type, with 2 logs, 6" x 6" x ⅝" angles, complete, ready to operate.

CLASSIFIER, Wemco, Simplex, 78" x 28½ ft. New condition.

BOOT BUCKET ELEVATORS: 2—63 ft. ec, manganese steel chain, buckets 16" wide.

SCREW CONVEYOR: 12" x 22 ft. with center bearing, 87 RPM, capacity 30 TPH.

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WAGON DRILL: Ingersoll Rand type D with X71 WD Drifter for 1¼" steel, with D-6-U hoist, mounted on steel wheels.

TRUCKS: Euclid 15 yd., model T, end dump, 22 ton capacity, 275 H.P. Cummins motors.

DIESEL MOTOR: 122 H.P. Caterpillar D13000 complete with clutch, V-belt pulley and spare parts.

BOILERS: 1—Erie City 150 H.P., ASME, return tubular, 4" tubes, 150 lbs. working pressure, pin hole grates and all fittings. 2—220 H.P., 160 lbs. pressure, National Board, 3 drum, low head, complete.

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25 ton Browning loco. crane new '41
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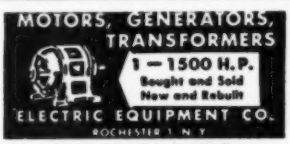

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Two 18"x18' trough belt conveyors & frames

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Cedar Rapids Portable Plant consisting of the following:

Primary Unit
1—20x36 RB Jaw Crusher
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The above units mounted on steel wheels and undercarriage. Priced Reasonable.

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All Mounted on K-8 Internationals

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One D17000 Caterpillar Diesel Motor—Serial 3-S-1544 which has 8,224 hours light service—Price $8,000.00.

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1—1½ yd. bucket
All necessary blocks & cable.
This equipment now in operation and may be seen. Available August 15, 1951.

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Cedarapids 24 x 16 Double Roll Crusher on skids, with flat belt pulley drive. $2800.00

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PROVE TO YOURSELF

How the Kue-Ken Principle of "Crushing Without Rubbing" Is Entirely New and Better Than Anything Offered in Over 90 Years of Crusher Design

Fig. 1
(Designed 1858)

CROSS-SECTION OF BLAKE-TYPE CRUSHER. Swing jaw toggles and pitman all move up and down together causing severe unbalance. Pitman is in tension and has to be made extremely heavy to resist breakage. This old fashion design frequently requires water jacketing to keep the unprotected poorly lubricated bearings cool. This means additional unbalanced weight. Low speed and low production is inevitable with this design.

IT'S EASY. Place point of a pencil compass on center of hinge pin on Blake diagram of oldstyle crusher fig. 1 and describe an arc anywhere along the face of the swing jaw. Note how jaw must *travel* the path of this arc, and how this path of travel is upwards in relation to the stationary jaw. (Changing shape of Jaw Plate cannot change path of travel, which is established by location of hinge pin.) This means that every piece of rock as it is being crushed is pushed upward, causing severe rubbing, extreme wear on jaw plates and wasted power.

Now, place compass point on center of hinge pin (K) in Kue-Ken diagram. Note that hinge pin is on center line of crushing zone.

Describe an arc and note that the path of travel is normal to both jaw faces. There is practically no upward movement, so rocks are crushed *without rubbing* and jaw plates last 5 to 10 times longer than any other crusher operating under equal conditions.

The Pitman R is always in compression, bears against the lower side of the shaft ONLY. Eliminates bearing caps, bolts and shims. 90% saving in Pitman weight permits 50 to 60% higher speed with corresponding increase in capacity and a more uniform product is obtained.

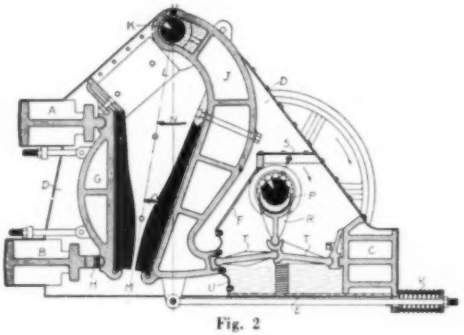

Fig. 2

Cross section showing MODERN DESIGN of Kue-Ken. All mechanism runs in a sealed, filtered oil bath. This "crankcase type" lubrication system requires oil change only twice yearly. Oil cans and grease cups banished forever. Integral safety device protects against tramp iron or overload without shearing or breaking parts—quickly reset. Adjustment of discharge opening is made on front jaw so that correct geometry of the toggles is never changed.

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Before Farval, a set of crusher bearings lasted only a year. After the Farval system had been in service 12 months, an inspection of the bearings showed them to be in excellent condition. Bearing replacement expense saved was $1,000.

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Farval is the original (patented) Dualine system of centralized lubrication that has proven itself through years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned.

Write for Bulletin No. 25 for full details. The Farval Corporation, 3280 E. 80th St., Cleveland 4, O.

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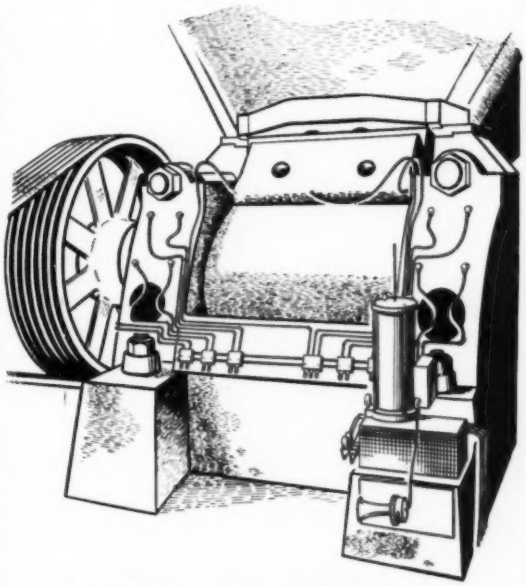
FARVAL—*Studies in Centralized Lubrication*
No. 120



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TEXACO

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